



University of Colorado **Boulder**

2017 Program Review

Department of Applied Mathematics

Academic Review and Planning Advisory
Committee Report

Approved

A handwritten signature in black ink, appearing to read "Paul Marshall".

03/20/2018

Provost and Executive Vice Chancellor for Academic Affairs : Date

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Process Overview

This review of the Department of Applied Mathematics (APPM) was completed in accordance with the 2017 review guidelines. The Academic Review and Planning Advisory Committee (ARPAC) conducts and writes the final reviews of all Boulder campus academic units. The unit prepared a self-study during 2016, which was checked in early 2017 by an internal review committee of two CU Boulder faculty members from outside of APPM, who also met with department personnel and carried out surveys of undergraduate and graduate students. The internal reviewers found the report thorough and fair. An external review committee, consisting of two experts within the discipline from outside of the University of Colorado, visited the unit over March 6-7, 2017, reviewed relevant documents, and met with faculty, students, staff, university administrators, and ARPAC members. The internal and external reviewers' comments and recommendations are cited at appropriate points throughout the report. This public document reflects the assessment of and recommendations for the Department of Applied Mathematics as approved by ARPAC.

Academic Review
and Planning
Advisory
Committee
(ARPAC)

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2017-18

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Bill Kaempfer, Senior Vice Provost and Associate Vice Chancellor for Budget and Planning and Professor of Economics

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Unit Overview

The campus' standardized description of the unit is available on the website of the Office of Data Analytics (ODA):

<https://www.colorado.edu/oda/institutional-research/institutional-level-data/information-department/academic-review-and-planning>.

ODA updates the profile annually during the fall semester. This report cites the ODA data for APPM posted in October 2016, reflecting the state of the department as of academic year (AY) 2015-2016. More recent data from the APPM self-study is cited where appropriate.

The Department of Applied Mathematics (APPM) is renowned for its faculty's research and for its excellent instruction across two colleges. The unit specializes in four areas: physical applied mathematics, nonlinear waves, dynamics and analysis; mathematical biology; computational mathematics and data sciences; and statistics and probability. The rankings of the National Research Council (NRC) affirm APPM's scholarly reputation. The department's faculty members have been recognized with campus awards and national and international accolades, including Guggenheim Fellowships and prestigious memberships in the American Mathematical Society (AMS) and the Society of Industrial and Applied Mathematics (SIAM).

Both the internal and external reviewers praise APPM. The internal reviewers conclude, "we gained a positive impression of all aspects of work carried out by APPM, including teaching of both undergraduate and graduate students and research... Profuse praise for the department and the people in it pervaded meetings with students, staff, and faculty." The external reviewers note, "APPM is a very strong department that fulfills all of its missions with excellence and dedication" and describes the department's research and teaching missions as equally strong.

Personnel
and
Governance

As of AY 2015-2016, the department included 19 tenured and tenure-track (TTT) faculty (11 professors, three associate professors, and five assistant professors), nine instructors/senior instructors, five lecturers, and one adjunct professor. The self-study notes 22 TTT faculty; the department hired three in 2016 (one associate and two assistant professors). An additional 43 teaching assistants (TAs), and one graduate part-time instructor (GPTI) provide instruction for the department. The self-study also notes that several of the unit's postdoctoral fellows participate in instruction, and that the unit hires additional lecturers on an as-needed basis. APPM also includes some "affiliated faculty" (49, according to the self-study) drawn from across the University of Colorado, from external national laboratories, and from other universities. Three administrative staff members provide strategic support.

Tenured and tenure-track faculty and senior instructors on three-year appointments elect a chair by secret ballot. Other department administrative positions include an associate chair responsible for overseeing the department's teaching duties, an associate chair for graduate studies, and several committees. These include a faculty search committee, an undergraduate committee, and a graduate committee.

As of AY 2015-16, APPM assistant professor salaries were close to peer averages among American Association of University (AAU) public institutions (at 97%) while full and associate professors lagged (86% and 88%, respectively). APPM successfully applied for raises for several full professors in the campus's recent non-merit salary exercise.

The APPM self-study expresses support for a revised administrative structure that would move several departments,

including APPM, out of the College of Arts and Sciences into a college of natural sciences. APPM believes that such a move would help the natural sciences “compet[e] most effectively for campus and extramural resources.”

Research, Scholarship,
and
Creative Work

The department’s research record ranks fifth in productivity out of eight units in its review cycle. Average research productivity per tenured/tenure-track (TTT) faculty member includes 0.2 refereed books and monographs (ranking fourth of seven relevant units), 20.2 refereed articles and chapters (seventh of eight units), and 26.7 conference presentations and papers (ranking seventh of eight units). The department’s grant expenditures per TTT faculty member for fiscal year (FY) 2016 was \$2,195,000, ranking sixth among nine relevant units in this review cycle. These rankings come from Office of Data Analytics research productivity data as of AY 2015-16, which includes the average number of publications and/or creative works produced per TTT faculty member from 2009-2015. This data is ranked both across all academic units on campus and within the smaller subset of those units sharing a review cycle.

National and peer institutions routinely recognize APPM’s excellence. The external reviewers reports “We were impressed by the research strengths of the department and by its choice of research directions, as represented by its junior faculty.” In the most recent (2010) National Research Council (NRC) rankings, APPM is ranked highly in measures including faculty publications, citation rates, grants, and awards. APPM faculty have received national and international research awards and memberships that indicate their high standing. The faculty include five fellows of the Society of Industrial and Applied Mathematics (SIAM), three fellows of the American Mathematical Society (AMS), two Guggenheim Foundation Fellows, one Fellow of the American Statistical Association (ASA), and two National Science

Foundation (NSF) Career awardees. The self-study includes many other such achievements.

Undergraduate Education

The Department of Applied Mathematics offers a B.S. and an accelerated B.S./M.S. in Applied Mathematics and has recently proposed adding a new B.A. in Statistics and Data Science. The department has 141 majors as of Fall 2015, a 33% increase over the previous five years. The unit has also increased its percentages of students from underrepresented backgrounds over the same period. The same five years saw a 4% increase in female students, a 32% increase in international students, and a 44% increase in students from underrepresented minority groups. During AY 2015-16, APPM awarded 43 bachelor's degrees (ranking fourth of six relevant units in this review cycle); this reflects a 13% increase over the previous five years. The median time to degree for students entering as new freshmen was 4.5 years, the fifth longest time to degree of six units in this review cycle.

The Department of Applied Mathematics serves undergraduate students from across the College of Arts and Sciences and the College of Engineering and Applied Science, generating 22,312 student credit hours (SCH) in AY 2015-2016 (fourth of six relevant units in this review cycle). This was a 52% increase over the previous five years. Non-majors take most of its SCH (94%), indicating a high level of service teaching. SCH production by tenured and tenure-track faculty decreased by 9% over the previous five years; their share of APPM's SCH production is 21%, ranking APPM fifth of seven units in this measure. Instructors and senior instructors taught 47% of SCH (first of six units in this measure); this is a 20% decrease over the previous five years. GPTI/TA's taught 5% (second of five units in this measure); this is a 37% decrease over the previous five years. Lecturers taught 27% (third of six units in this measure), a marked 164% increase over the previous five years.

Spring 2016 Office of Data Analytics surveys of seniors majoring in the Applied Mathematics noted that 64% of graduates were planning on full-time or part-time employment after graduation, ranking first of five units in this review cycle, and that 27% of the graduates intended to begin graduate school, ranking third of five units. Of these seniors, 79% were satisfied with their major (first of five units in this measure), 70% were satisfied with the effectiveness of APPM courses in providing a good general education (fourth of five units), and 74% were satisfied with how well CU Boulder prepared them for the job market (second of five units).

The satisfaction level of undergraduate students majoring or minoring in the Department of Applied Mathematics is high. The internal review committee's surveys of APPM major and minors in Spring 2017 garnered 86 responses: eight first-year students, 18 sophomores, 26 juniors, and 34 seniors. A total of 90% rated their overall satisfaction with the department as "satisfied" (31.4%) or "very satisfied" (59.3%), 8% were "neutral," and only 1% were "dissatisfied." Surveys showed high satisfaction with "logical sequencing and continuity of courses," required course and electives availability, and staff and faculty advising. Students expressed less satisfaction with scholarship and research support (51% and 68% "satisfied" or "very satisfied," respectively). Written comments in the undergraduate survey expressed a high level of satisfaction with APPM faculty and provided several thoughtful suggestions about additional courses and curricular tracks that might be offered, including in discrete math and complex numbers.

A substantial share of students who declare Applied Mathematics as their first major stay within the major. ODA data for the undergraduate cohorts entering CU Boulder between 2007 and 2010 show that, of students declaring Applied Mathematics as

their first major, 62% graduated in that major within six years. The comparable figure for natural sciences majors in general during the same period saw 48% of students graduating within six years in the major they first declared. Of those declaring Applied Mathematics as their first major, 68% graduated with a College of Arts and Sciences degree (any major) within six years, and 87% graduated from CU Boulder overall (any college). Campus-wide, the six-year graduation rate for these cohorts was 70%.

Graduate Education

The Department of Applied Mathematics offers Ph.D. and M.S. degrees (with tracks in general applied math, computational science, and engineering), as well as an accelerated B.S./M.S. degree. APPM has also recently added a professional master's (M.S.) program.

The department had 81 graduate students in 2015-16. The Office of Data Analytics reports 17 master's degrees were awarded in AY 2015-16, a 23% decrease over the previous five years, with a median time to degree of 2.5 years. However, the same period witnessed a 116% increase in students earning a concurrent BS/accelerated MS degree. The unit awarded eight doctoral degrees in AY 2015-16, a 60% decrease over five years, with a median time to degree of 5.72 years (second of seven relevant units in this review cycle).

As with the undergraduate responses, graduate responses to the internal review committee's student survey indicated a high level of satisfaction with most aspects of the department. Overall, 89% of graduate students declared themselves "satisfied" (51%) or "very satisfied" (38%) with the APPM graduate program. Among the factors in the program contributing to graduate student satisfaction were required course and electives availability and advising quality. Graduate students expressed less satisfaction (ranging from 61% to 77% satisfied) with the clarity of program

requirements, the ease of identifying an advisor, the availability of guidance about conference attendance and publication, and financial support. While written comments on the survey praised APPM faculty and advising, numerous students articulated dissatisfaction with poor teaching in some graduate courses and with for a general lack of preparation by faculty for preliminary exams.

The department recently added a professional master's degree and is considering adding another in statistics to match the already proposed undergraduate degree. In addition, APPM is working with the College of Engineering and Applied Science to combine the B.S. in Applied Mathematics with the M.S. in Interdisciplinary Telecommunications, according to APPM's self-study.

The Department of Applied Mathematics has worked to provide a supportive environment for its postdoctoral research faculty. The self-study indicates that as of fall 2016, APPM had nine postdocs. Three postdoctoral fellows participate in instruction, and according to the self-study, APPM plans to increase that number to eight.

Though the self-study describes the mentoring systems in place for graduate students and postdoctoral students, graduate or postdoctoral placements go unmentioned; this information would be helpful and APPM should develop a procedure for collecting such data.

Space
and
Infrastructure

Department of Applied Mathematics personnel are currently spread across six buildings, and this dispersal of tenured/tenure-track faculty, graduate students, and others engaged with instruction and research across so many locations is a concern. Different groups in the department are housed in separate facilities. Faculty, postdoctoral fellows, and some research

assistants, as well as some computer labs and a learning center occupy space in the Engineering Center. Meanwhile, the Fleming building houses lecturers, another learning center, and the Statistical Colaboratory. Further TA and RA offices are divided between the Math building and the stadium, with various other pivotal department resources being housed in Duane Physics and a Grandview neighborhood bungalow. Classes are held in the Engineering Center and in the Fleming, Ramaley, and Muenzinger buildings. Such dispersal serves to atomize the department, whose culture could be improved by greater centralization.

Inclusive Excellence

Department of Applied Mathematics faculty are comprised of relatively few women and minorities, though the unit is committed to improving these percentages. ODA data indicate that as of AY 2015-16, the 20 APPM tenured and tenure-track faculty included two women (10%), ranking the unit sixth of eight relevant units under review, and four members of underrepresented minority groups (20%), ranking the unit first of eight units. The undergraduate student body includes 26% women and 9% members of underrepresented groups. Diversity in the graduate student body is similar, with 27% women and 8% members of underrepresented minorities. Though these percentages are low, they represent progress, as they constitute respectively a 57% increase in the number of women over the previous five years, and a 3% increase in the minority population over the same period. In AY 2015-16, 5% of undergraduate majors and 20% of graduate students were international students.

The self-study admits that “the lack of diversity amongst faculty, students and staff is an issue” and mentions (but does not detail) the department’s hopes to improve hiring and retention of a more diverse faculty and student population. Nevertheless, internal review student survey responses indicate that 96% of both APPM undergraduate and graduates “agree” or “strongly” agree that the

department encourages a climate that is tolerant and respectful of diversity. However, graduate student comments included in the self-study indicate that women feel isolated within the department, and the self-study mentions that the wide dispersal of APPM personnel across campus adversely affects some students' sense of safety.

Past Reviews

The Department of Applied Mathematics was last reviewed in 2010. That review, like this one, concluded that APPM is an outstanding department with a national and international reputation for excellence in both teaching and research. The 2010 review identified several opportunities for the department to improve, including a call for APPM to address current and future space needs; to recruit mid-career level faculty to replace retiring senior faculty in an orderly fashion; to expand the postdoctoral program; to support the development of the Interdisciplinary Computational Science and Engineering program; and to better understand the admissions and graduate student funding practices of peer and aspirant graduate programs, and to use this information to maintain a competitive position relative to those programs. APPM has made good progress in addressing these recommendations, with the notable exception of gaining better space.

Campus Context

The Department of Applied Mathematics contributes significantly to CU Boulder's teaching and research missions. As mentioned above, APPM's student credit hour production has increased dramatically in recent years, largely due to the growing size of undergraduate programs in the College of Engineering and Applied Science. A large proportion of APPM's service teaching goes to supporting engineering students. The quality of this instruction is well known: current APPM faculty include two Distinguished Research Lecturers, one Professor of Distinction, one Hazel Barnes Prize winner, and two Presidential Teaching Scholars. As described in the self-study, APPM faculty engage in interdisciplinary work with researchers external to the department, including with groups in Physics and with geosciences units. Also, faculty from outside of APPM but affiliated with the department work extensively with its graduate students.

Disciplinary Context

Indicative of its national and international standing, Department of Applied Mathematics faculty members have received numerous research awards and memberships. The self-study describes APPM's research collaborations with many groups and projects beyond CU Boulder, including, for example, the National Institute of Standards and Technology. APPM-affiliated faculty include members from institutions outside CU Boulder.

Analysis

The Department of Applied Mathematics is a high-performing unit valuable within CU Boulder and highly-regarded outside. To maintain and extend its prominence in research and teaching, APPM should attend to opportunities and challenges having to do with interdisciplinary research and teaching, undergraduate course size, graduate program improvements, and climate and inclusive excellence. In addition, APPM needs help from college and campus administrators with its longstanding and growing need for contiguous space.

Department Structure and Campus Collaborations

ARPAC commends the department for the quality and breadth of its interdisciplinary research and how these contributions aid other campus units. The Department of Applied Mathematics also contributes significantly to CU Boulder's teaching mission, and ARPAC predicts that these demands on its time will continue to grow. The committee encourages the department to formalize its interdisciplinary teaching ambitions. Given the increasing use of big data in advertising, public policy (economics, sociology), public health (biology), marketing, finance, and medicine, the interest by employers for graduates with skills in database management, programming, natural language programming, statistics and econometrics, and survey design is expanding. APPM has proposed a B.A. in Statistics and Data Science and is considering proposing a similar degree at the master's level, and ARPAC concurs that this is a step in the right direction.

ARPAC encourages Applied Mathematics to seek further opportunities to collaborate with the Department of Mathematics going forward. The self-study does not dwell on collaborations between Applied Mathematics and Mathematics, other than mentioning the latter's support of the proposed statistics and data science degree. Information from the concurrent Department of Mathematics review, however, indicates potentially fruitful collaborations to be explored between the two departments. While

the Department of Mathematics external reviewers suggest that the separation of these departments makes less sense today than it may have in the past, they are nonetheless separate units and will likely remain so for the immediate future. Though interested parties have discussed creating a school of mathematical sciences incorporating Applied Mathematics, Mathematics and a proposed statistics department, that effort has not gotten off the ground. Therefore, ARPAC believes it is critical for Applied Mathematics and Mathematics to work collaboratively rather than as rivals going forward. While ARPAC can neither dictate nor predict what structures might emerge as these fields develop, collaborations should ultimately lead to a more robust campus mathematics community, taking advantage of the strengths of each department in research and pedagogy to create a stronger whole from the separate parts. Collaborations, beyond faculty research collaborations, can and should include joint participation on search committees, as well as cooperation on curricular development and the elaboration of new pedagogy models. While ARPAC understands that to some extent these units' missions diverge, they also intersect in significant ways. Cooperation can help avoid inefficiencies in the development and delivery of teaching and, in addition, can help improve the breadth of campus research opportunities.

The Department of Applied Mathematics and several other departments have proposed the breakup of the College of Arts and Sciences into smaller colleges, including a college of natural sciences. Given the growing sentiment in multiple departments for such a breakup, it appears to be time for a serious discussion of the merits of the proposal. However, any discussion of a split should also anticipate possible negative impacts. If a plan can be developed that addresses these possibilities and describes a path forward, it should be proposed to the provost.

Space
and
Infrastructure

The department's concerns regarding contiguous space raised in the 2010 ARPAC report and recommendations have since intensified. Both the internal and external reviewers emphasize that the problem of non-contiguous space negatively affects APPM's teaching and research missions. The external reviewers provide a thoughtful two-tiered solution to this problem: given that some engineering departments have moved to the East Campus, APPM could be consolidated in the Engineering building. Meanwhile, the College of Arts and Sciences, the College of Engineering and Applied Science, and the provost should work with APPM to develop and execute long-term plans to better unify the unit.

Undergraduate
Education

ARPAC applauds the department's efforts to reduce undergraduate course sizes, but also notes that non-tenure/tenure track faculty teach a large and growing percentage of undergraduate student credit hours. This development causes ARPAC concern, especially given the pedagogical challenges arising from such technical subject matter. ARPAC recommends that APPM make a case for hiring more tenured and tenure-track faculty, specifically to cover courses now taught by lecturers. If this proves untenable, APPM should propose hiring additional instructors.

As mentioned above, the proposed B.A. in Statistics and Data Science is a promising development for APPM. The fields of big data, data informatics, and statistics are growing, leading to increasing demand in the information/tech sectors for employees with these skills. The number of attractive, well-paying jobs available is increasing at a significant rate. Assuming this new degree is approved, APPM and College of Arts and Sciences should highlight the possibility of such attractive career options to CU Boulder first-year students and, equally importantly, to Colorado high school juniors and seniors. Such publicity could

help recruit more diverse students to APPM's undergraduate program.

Graduate Education

The department's graduate program has problems with recruitment and retention that need addressing. The external reviewers note, "The graduate program is becoming non-competitive due to the low stipends... We recommend that the College of Arts and Sciences direct some of its fundraising efforts towards supporting graduate students... the University should consider raising graduate TA stipends." While ARPAC notes that graduate stipends were raised by 6.9% and 5% in the past two years, additional funds would help with attracting and retaining the best graduate students. Beyond increasing stipends, APPM could investigate whether funds might be made available from College of Arts and Sciences or from within the department to provide scholarships to attract/retain top graduate students. Additionally, APPM could use revenue from the new professional master's program to enhance RA/TA funding.

In responses to the IRC survey, graduate students expressed concern that preliminary exam content depends too much on who is writing the questions and does not correlate with what is being taught in core graduate courses. ARPAC urges APPM to align preliminary exam expectations more closely with learning outcomes offered by these courses.

APPM should also work with the Office of Data Analytics and internal records to track outcomes and placement metrics for graduate students as well as for postdoctoral fellows.

Inclusive Excellence

ARPAC is concerned by the lack of concrete details in the department's plans for increasing diversity and equity. The unit should work with the Office of Diversity, Equity, and Community Engagement (ODECE) and others such as the Boulder-based

National Center for Women and Technology, to develop strategies for recruiting more women and members of underrepresented minorities to tenured and tenure-track faculty positions. APPM should make full use of the Strategic, Targeted, and Accelerated Recruitment (STAR) program and the Chancellor's Postdoctoral Fellowship program to attract tenured/tenure-track faculty from underrepresented groups, including women. ARPAC also recommends that APPM familiarize itself with research showing the impact of including more than one female/underrepresented minority candidate in job finalist pools.¹

To recruit more women undergraduate students, the Department of Applied Mathematics should consider such strategies as enlisting women currently associated with APPM (both undergraduates and faculty) to serve as recruiting liaison in Colorado high schools. APPM should also consult with the College of Engineering and Applied Science about its Broadening Opportunity through Leadership and Diversity (BOLD) program for recruiting and fostering success among diverse student populations. ARPAC recommends the unit also consider lobbying the college dean to help secure an affiliation for CU Boulder with the Association for Women in Mathematics.

To enhance graduate student recruitment and support, the Department of Applied Mathematics should work with ODECE to obtain funding through the Colorado Diversity Initiative (CDI), which is directed toward providing science, technology, engineering and math Ph.D. applicants with an additional incentive to enroll at CU Boulder.

¹ See, for example, "If There's Only One Woman in Your Candidate Pool, There's Statistically No Chance She'll Be Hired." *Harvard Business Review*, April 26, 2016.

Recommendations

The members of the Academic Review and Planning Advisory Committee (ARPAC) address the following recommendations to the Department of Applied Mathematics, and to the offices of responsible administrators:

To the unit

1. Continue work being done to expand the undergraduate program, including supporting a new B.A. in Statistics and Data Science. Develop a proposal for an analogous graduate degree in statistics and data science. Work with College of Arts and Sciences to advertise the potential job prospects for graduates from these programs.
2. **Work with College of Arts and Sciences and the Department of Mathematics to revise and update the memorandum of understanding defining the departments' respective areas of responsibility.**
3. **Encourage faculty research and teaching collaborations with other units on campus, such as the Department of Mathematics.**
4. **Work with College of Arts and Sciences and with the Department of Mathematics and other interested units to establish a joint mathematical sciences curriculum and pedagogy committee to oversee all math classes and degree curricula.**
5. Include as appropriate members on faculty search committees from allied departments such as from Physics and Mathematics.
6. Work with the deans of College of Arts and Sciences, the College of Engineering and Applied Science and the provost on securing appropriate and adequate class space and

contiguous offices for faculty, post-doctoral fellows, TAs, and staff.

7. When proposing instructional personnel hires, whether tenured/tenure-track faculty or instructors, analyze the likelihood of such hires helping to decrease the size of undergraduate courses and diminish the department's reliance on lecturers.
8. Work with the Office of the Senior Vice Provost and the quality initiative leader to develop formal mechanisms for articulating learning outcomes and measuring student success.
9. Work to make graduate preliminary examination content consistent and to align the learning outcomes offered by core graduate courses with graduate preliminary exam expectations.
10. Investigate the availability of college or department funds—for example, revenue from the professional master's program—to provide scholarships to attract and retain top graduate students.
11. Work with the Office of Data Analytics and internal records to collect information about job placement for graduate students and postdoctoral fellows.
12. Work to increase the diversity of the faculty in upcoming faculty searches. Work with the Office of Diversity, Equity, and Community Engagement (ODECE), the National Center of Women in Technology, and the Office of Faculty Affairs to develop a concrete faculty recruitment plan for women and members of underrepresented minorities, using tools such as the Strategic, Targeted, and Accelerated Recruitment (STAR)

program and the Chancellor's Postdoctoral Fellowship program. In reporting progress on this recommendation, include the makeup of the finalist pools for each faculty recruitment. Aim for finalist pools that include multiple diverse candidates.

13. Consider strategies for recruiting additional female and underrepresented minority undergraduate students. Such strategies might include recruiting current APPM women undergraduates and faculty to serve as recruiting liaisons in Colorado high schools; consulting with the College of Engineering and Applied Science about its Broadening Opportunity through Leadership and Diversity (BOLD) program; and working with the College of Arts and Sciences to support the department's efforts to secure an affiliation for CU Boulder with the Association for Women in Mathematics.

14. Work with ODECE to obtain funding for PhD applicants through the Colorado Diversity Initiative (CDI).

15. In any future non-merit salary exercise, make a case for salary increases for APPM full and associate professors through appropriate comparisons with full and associate professors at peer/aspirant AAU schools.

To the Dean
of the
College of Arts
and Sciences

16. Work with departments of Applied Mathematics and Mathematics to revisit and update the **memorandum of understanding** defining the relative responsibilities of the two departments.

17. Work with Applied Mathematics, Mathematics, and other units to establish a joint mathematical sciences curriculum committee.

18. Support work to establish a branch of the Association for Women in Mathematics at CU Boulder.

19. Consider metrics that compare the unit's research and scholarship measures with those of Applied Mathematics faculty in peer or aspirational schools;

To the Deans of the
College of Arts and
Sciences and the
College of Engineering
and Applied Science and
to the Provost

20. Work with the Department of Applied Mathematics on securing appropriate and adequate class space, and contiguous offices for faculty, members postdoctoral fellows, TAs, and staff. Consider fully consolidating APPM in the Engineering building in the near term. Develop long-term plans to unify APPM in contiguous space.

Required Follow-Up

The chair of the Department of Applied Mathematics shall report annually on the first of April for a period of three years following the year of the receipt of this report (i.e., April 1st of 2019, 2020, and 2021) to the dean of the College of Arts and Sciences and to the provost on the implementation of these recommendations.

Likewise, the deans of the College of Arts and Sciences and the College of Engineering and Applied Science shall report annually on the first of May to the provost on the implementation of recommendations addressed to the colleges. The provost, as part of the review reforms, has agreed to respond annually to all outstanding matters under her/his purview arising from this review year. All official responses will be posted online.