

Request for Proposals
Type 1: New Department-based Initiatives
(Funding for New Departments)
Fall 2010

Science and math departments in the College of Arts & Sciences are invited to contribute a proposal for funding from the CU Science Education Initiative (SEI). **The deadline for submission is December 17, 2010.** Proposals will be reviewed by the SEI Director and representatives of the SEI advisory board. Funding decisions will be made by January 15, 2010.

Between 2006 and present, 5 departments have received funding to enable sustained improvements in undergraduate science education. These departments are: Chemistry, Geological Sciences, Integrative Physiology, MCDB, and Physics.

In this round of funding, two categories of proposals will be accepted: Type 1 New Department-based Initiatives, and Type 2 Enhancing Sustainability in previously-funded departments.

Type 1: New Department-based Initiatives (Funding for New Departments)

Departments that were not funded previously are eligible and encouraged to submit proposals for funding. We anticipate funding 1 new department in A&S.

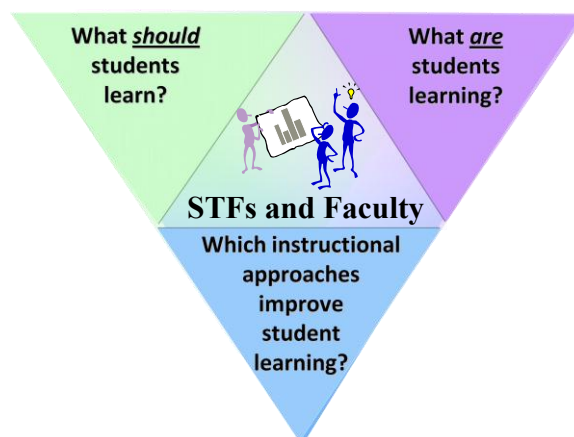
Budget: up to a total of \$500K distributed over 3-4 years.

Proposal length: up to 10 pages single-spaced, including budget.

(New departments or individual faculty interested in funding of smaller education projects are encouraged to apply for funding from ISTEM, see <http://www.colorado.edu/istem/ChancellorAward.html>).

The fundamental criterion for funding is the probability of achieving widespread sustained improvement in undergraduate education. It is expected that any efforts will be built on the three foundational elements of:

- 1) Reaching agreement within the department on measurable educational goals (i.e. what students should be able to *do*).
- 2) Rigorously evaluating what students are actually learning to determine how well they are achieving those goals.
- 3) Where necessary, making changes in materials, curriculum, and/or teaching practices to better achieve the desired goals.



Departments interested in participating should submit a proposal by December 17, 2010 to the SEI Director, Kathy Perkins (Kathy.Perkins@colorado.edu).

Type 1 Proposals: New Department-based Initiatives

These proposals need to contain an extensive discussion of planning and implementation of the educational improvement efforts to be undertaken by the department. Specifically, these proposals should discuss:

- A plan for sequence – which courses are to be addressed, in what order and timeline – and, the logic behind the plan.
- Description of the activities/approaches that will be used to address the three foundational elements of the SEI, and sustainability:

Element	Some approaches/activities used in SEI-funded departments – but new departments are not limited to these approaches:
What should students learn?	Faculty working groups; Faculty interviews; Alumni interviews; Future employer surveys; Discussions at faculty meeting; etc.
What are students learning?	Student surveys; Student interviews; Analysis of student work/exams; Classroom/recitation observations; Faculty and STF-developed, research-validated, conceptual assessments of learning goals; Literature reviews of published difficulties; Compilation of student difficulties; etc.
What instructional approaches help students achieve these learning goals?	Integration of interactive teaching in class (clickers, group work activities, student-student discussions); Alignment of in-class, out-of-class, and exams with key learning goals; Addition of or modification to homework assignments; Addition of or modification to recitation activities; Use of Learning Assistants; Addition of or modification to department TA training programs; Modification to lab activities; Student use of learning goals; etc.
Sustainability	Compilation and electronic archiving of materials developed (SEI has an archive available); Faculty engagement; New departmental physical or teaching structures; New committee assignments; etc.

See [Supplementary Materials](#) for more guidance from education research and from approaches/experience of other SEI-funded departments.

- Plans for how to achieve coherence across the program and within course sequences.
- Plans and mechanisms to ensure sustainability of the educational improvements.
- How leadership and oversight of the effort will be provided within the department.
- The scale of faculty participation, how faculty member efforts will be recognized within the department, and what the mechanisms will be for establishing faculty consensus on educational goals, practices, and assessments.
- A measure of faculty interest and support in this activity, including a faculty vote approving the application and committing the department to carrying out the proposed program.
- A budget, including breakdown by major categories of expense. Examples of acceptable expenditures by current SEI departments include, but are not limited to, funding of:
 - Science Teaching Fellows: post-doctoral researchers with grounding in the discipline at the PhD level and strong interest or experience in education. SEI departments now typically spend \$40,000 to \$45,000 per year per STF, plus benefits.
 - Team teaching where 2 faculty partner on one course. The SEI department funds then pay \$6-8K for replacement cost for faculty.

- Undergraduate Learning Assistants (see <http://laprogram.colorado.edu/>). Current SEI departments spend \$0-6K per year on LAs.
- Support for Faculty and STF development of new curriculum / materials. Current SEI departments spend \$0-12K per year on faculty time for such activities – typically as summer support.
- Student interviews. (These are funded by SEI Central).
- Student assistants to help with data collection / processing / archiving. Current SEI departments spend \$0-10K per year on hourly and summer assistants.
- Expenditures to support sustainability of any activities, practices, structures, cultures, or outcomes that were achieved with SEI funding.
- STF professional development / training: Conferences and publication. Current SEI departments spend about \$1-3K per year per STF on such needs.

Evidence of departmental commitment to these activities through contributions of resources – such as reducing participating faculty teaching loads, assignment of TA resources to support educational improvement efforts, reallocation of funds, restructuring teaching space to support alternative teaching models (e.g. tables/desks for group work) – will be reviewed favorably.

Supplementary materials to help departments develop their proposals are available online: <http://www.colorado.edu/sei/SEI-SupplementaryMaterials.pdf>.

In addition, Kathy Perkins, SEI Director, and departmental directors in existing SEI-sponsored units (David Budd, Geological Sciences; Steve Pollock, Physics; Bill Wood, MCDB; Bill Byrnes, Integrative Physiology, Robert Parson, Chemistry) are happy to discuss and give feedback on proposal ideas with members of departments prior to their proposal submission.

When considering the scope and implementation plans of a Type 1 proposal, departments should seriously consider the following factors that have supported departments at CU or UBC in their past SEI efforts.

Factors Facilitating Efforts
<i>Department-level</i>
<ul style="list-style-type: none"> • Broad faculty support and involvement • STFs highly visible, treated as colleagues • Reward structure for involvement in SEI-related activities • Supportive, respected chair with authority • Senior and junior faculty leaders who promote the project • Advanced planning of teaching assignments
<i>Faculty-level</i>
<ul style="list-style-type: none"> • Faculty dissatisfied with student learning and committed to improving it • Prior exposure to alternative teaching approaches • Desire to learn about findings from education research, and to research what helps their own students' learning (in collaboration with dept STF)
<i>Course-level</i>
<ul style="list-style-type: none"> • Structures and resources to support active learning and other changes (classroom spaces, recitation time, TA support)