

Pre-proposal: Award to Recognize Department Culture that Meaningfully Values Learning Excellence

The Department of Geology values learning excellence at the undergraduate and graduate levels with instructional programs that emphasize student engagement in the learning process, whether in regularly scheduled lecture, laboratory, and field courses or in non-scheduled, undergraduate and graduate research experiences. Our emphasis on learning outside the classroom sets us apart from other disciplines and addresses pedagogical theory that stresses the importance of hands-on learning.

Commitment to sustained excellence in teaching and learning

The Department of Geology has long been the outstanding teaching unit within the College of Science. Student evaluations of courses at all levels, including undergraduate courses for non-majors, are consistently well above the averages for other departments in the college, and for the university as a whole. While student evaluations present only a partial picture of department teaching excellence, they are clearly a starting point for evaluating teaching excellence across units within the university because they assess the same things using the same procedures in all units. We also focus on providing in-depth, hands-on learning experiences for all of our students, including non-majors in survey courses, geology majors in core curriculum and elective courses, and graduate students. Our commitment to excellence in teaching is underscored by the College of Science Faculty Teaching Award, which has been won by three faculty from our department. Teaching impact is also indicated by the continued strong support of our alumni to department development.

Almost all of our lower division courses involve either or both field trips and laboratory experiences – which are expensive and require a significant input of personnel resources (faculty and TA). We emphasize field and lab experiences because we feel that it is not possible to understand science without “getting your hands dirty”. Science is *not* the rote memorization of facts and revealed wisdom – *it is the process of inquiry into how the world works* and our relationship to the world. Our commitment to inquiry centered learning is illustrated by our development of a new interdisciplinary University Studies course “*Planet Earth*”, one of the most popular breadth science courses. We are also seeking external funding from NASA for a new “earth system science” course for in-service teachers, and have other education-related initiatives in progress.

Engaged learning is continued in our upper division courses for majors: almost all involve either or both field trips and laboratory experiences that engage small groups of students with the faculty on a personal basis. Our capstone course is a required Summer Field Camp experience that lasts five weeks and pairs our graduating seniors with our faculty in a series of projects designed to test and expand their knowledge and abilities as scientists. Students and faculty essentially live together in tents for five weeks, sharing food, conversation, and the physical challenges of field work. *It is truly a “capstone experience” that shapes our graduates’ perceptions and values for the rest of their lives.* It demands much of our faculty, who participate for only nominal compensation after completion of their normal nine-month contract commitment.

We also work with the honors program to provide superior breadth and depth science courses for honors students, who are not only our best and brightest students, but also our most demanding in terms of education quality. *These courses are taught by full professors with robust research programs who are intimately involved with advancing science in their research areas.* They are able to share with their students an excitement for science that cannot be achieved by faculty who are not research-oriented or personally involved in addressing scientific questions of current importance.

Faculty development for teaching

All of our faculty are encouraged to attend workshops and meetings devoted to pedagogy, and funds are provided for those who attend; the attendees also share their insights with the faculty on their return. For example, last year one of our senior faculty attended an NSF-sponsored workshop on course and curriculum design that has resulted directly in the development of a new class to offered next year. Teaching and curriculum are discussed every year at the Department Retreat, which typically lasts two days in late summer. In addition, all new TA’s meet with supervising faculty for orientation at the beginning of each semester and are monitored throughout the semester. All faculty receive feedback through our peer review of teaching process (see below).

Ongoing assessment and improvement of teaching and learning quality:

Overall assessment of teaching and learning quality in all classes and for all faculty is carried out through two complementary processes: student course evaluations (which are standardized across the university) and peer review of teaching, which is carried out at least annually for all faculty members within the department. Student evaluations are discussed above. *Peer review of faculty* is carried out using a standardized form that addresses both the mechanical aspects of teaching (preparedness, syllabus, start/end on time) and the pedagogical aspects (how is the material presented, does the professor interact with the class, are the students engaged in the learning process). This form was developed in conjunction with John Carpenter, Director of the Center for Science Education at the University of South Carolina, specifically for peer review of science faculty.

In addition to these metrics, the Department of Geology relies on a variety of tools to assess its undergraduate degree programs, including student input, alumni participation, and faculty program assessment (information from all sources is discussed and reviewed by all faculty and used to modify program objectives, course content, and degree requirements). Learning outcomes are assessed in our “capstone” course. Finally, we have recently instituted an Advisory Board (which will meet this April) composed of alumni and employers, all of whom work in professional areas that hire our graduates, to assess our programmatic strengths and weaknesses, and to tell us what works, what doesn't, and how to get better.

Provision of resources for students

The Department of Geology provides a variety of resources for students to use both informally and in formal coursework. These resources include (1) a student study room, with open access computers and a new high capacity laser printer; (2) the geology library (located next to study room), which provides a wide range of geologic books and journals; (3) the geology map room, which houses all US Geological Survey topographic and geologic maps for Utah and most western region maps; (4) rock and mineral preparation rooms; (5) analytical facilities open for student use in research projects and classes, including new x-ray fluorescence and x-ray diffraction spectrometers; (5) GIS labs with large format color plotter, scanners, digitizing tablets; (6) complete field equipment for field trips and summer field camp, including large work and cook tents, trailer, stoves, coolers, etc. The student study room is particularly important because it provides a place where our students can interact outside of the classroom and cooperate on projects both formally and informally. We send our students to professional meetings (both graduate and undergraduate), and we schedule both courses and field trips to avoid conflicts for majors. We also sponsor a Geology Club whose activity level varies depending on the students involved, and we have two endowments started by faculty donations to support field trips and research by undergraduates.

Linking discovery, creative activity, and engagement with teaching and learning for the benefit of students.

The Department of Geology places great emphasis on learning through engagement in research and discovery. This is demonstrated by the large number of undergraduate research projects we supervise, undergraduate participation in faculty research projects, and senior theses supervised. Three of our eight faculty have received Research Experience for Undergraduate supplements to their NSF research grants over the last year, and we have *supervised a total of 10 undergraduate research projects and senior theses (about 35% of our senior class)*. This January we had two students present Posters on the Hill (*Natalie Jorgensen* and *Angela Carter*), and last Fall two undergraduate students (*Rob Mackley* and *James Eddleman*) were coauthors of a paper with Assistant Professor Joel Pederson that was published as the cover article in *GSA Today*, the lead journal of the *Geological Society of America*. We also had six undergraduate present abstracts at regional or national meetings. Three undergraduate students traveled to Taiwan to study active faults, and one or two more will travel to China this coming summer. Due in large part to these enriching research opportunities, over one-third of our undergraduates go on to top quality graduate schools.

We also engage our graduate students in field and laboratory studies, involving projects in Utah, Arizona, California, Montana, Idaho, Taiwan, and China over the last year. *Of the ten Master's students who completed their degrees in the last year, all are either employed or continuing their education.* Two of our recent master's are in PhD programs (UC Santa Barbara and Stanford), five are employed at major international energy companies, and three have jobs with government agencies or as teachers. Our graduate students are highly recruited by the petroleum industry, which provides not only high paying jobs for our graduates (starting salaries in the mid-60's) but also support for our educational programs.

In summary, the Department of Geology at Utah State University has an established track record of Teaching and Learning Excellence that is the direct result of a departmental culture that values and rewards outstanding efforts both in the classroom and in the greater world beyond the classroom. In my thirty years of academic experience, I have never been associated with a department that emphasizes teaching and learning excellence like we do here.