

DEPARTMENT OF EARTH & ENVIRONMENTAL SCIENCES
California State University, Fresno
Graduate Program Assessment

MISSION STATEMENT

The Department of Earth and Environmental Sciences provides graduate training in the Earth Sciences with opportunities to specialize in several areas of advanced study and research. This background allows students to pursue a variety of careers in industry, government, teaching, or to enter Ph.D. programs. The Department of Earth and Environmental Sciences graduate program provides training for students who wish to enter Master's level careers in the Earth Sciences, prepares graduate students for teaching Earth Sciences in the primary and secondary schools, and provides a foundation of skills for students who seek advanced degrees at universities offering doctorate degrees.

Earth Science is an interdisciplinary science, integrating aspects of physics, chemistry, mathematics, biology, and computer science, as well as incorporating philosophical and critical thinking skills to address geological, environmental, and social problems. As a result, the Department trains graduate students to become well-versed in a broad spectrum of scientific disciplines.

GOALS

Goal 1: Develop skills for acquiring new knowledge, both for matriculation and for success in post Master's Degree activities.

Objective 1.1: To provide the graduate student with the ability to learn and conduct research in the Earth Sciences, both independently and collaboratively. Students will demonstrate the application of inductive and deductive methods of reasoning, the use of geological and geophysical data for interpretation, and how to arrive at valid, defensible conclusions. Students will demonstrate their ability to conduct background studies using published scientific research. They will learn how to formulate questions of previous published scientific studies, and identify critical new research paths that build on previous work.

Goal 2: Enhance the student's depth of understanding of a broad range of topics in the Earth Sciences.

Objective 2.1: To increase graduate student knowledge in both specific areas of thesis research, such as stratigraphy, structural geology, geophysics, hydrology, etc., and any related specialties of the Earth Sciences required to conduct research.

Objective 2.2: To broaden graduate student knowledge in disciplines that are related to or supportive of their thesis research.

Goal 3: Increase the student's understanding of field observation and data acquisition techniques, experimental methods, data analysis, and their application to timely issues in the Earth Sciences.

Objective 3.1: To apply the scientific method and hypothesis formulation and testing for the design and implementation of a formal thesis research project, including planning the data acquisition phase of the thesis project so that the research objectives can be achieved.

Objective 3.2: To analyze observational and experimental results through application of quantitative statistical and other analysis techniques, where appropriate.

Goal 4: Enhance communication skills, both written and oral, for purposes of conveying Earth Science information to both professional scientists and non-scientists.

Objective 4.1: To improve oral presentation skills through participation in graduate seminar presentations, teaching assistant experience, and presentations at professional meetings.

Objective 4.2: To improve written communication skills through participation in writing seminars, thesis preparation, and publication of research results.

Objective 4.3: To present the results of the Master's research project at a special Departmental seminar.

Objective 4.4: To present the results of the Master's research project at regional or national professional meetings, where appropriate.

Goal 5: Promote high ethical standards and integrity in the conduct of scientific research and the presentation and use of research results.

Objective 5.1: To develop an understanding of the difference between the objective process of observation/data acquisition and the evaluative process of data analysis and interpretation, with emphasis on multiple working hypothesis techniques.

Five Year Program Assessment Plan

Initial assessment of graduate student learning outcomes in the Department of Earth & Environmental Sciences will include both quantitative methods and qualitative methods. Because Master's students are all required to accomplish a specific set of goals, such as the completion of a Master's thesis, year to year evaluation of these common products will allow the Department of Earth & Environmental Sciences to assess whether or not the program is improving in meeting its goals over time.

Quantitative evaluation methods include:

- Performance on standardized examinations, such as the GRE exam.
- Rate of admission to Ph.D. programs.

Qualitative evaluation methods include:

- Faculty evaluations of graduate student performance in such specific areas as the thesis, the oral thesis seminar, and the Graduate Seminar (thesis proposals).
- Interviews and surveys with program graduates, colleagues, and employers.

Evaluation methods will be implemented on the following schedule:

1) Faculty Evaluation of Thesis Proposal Presentations (Geology 201)

Each spring semester new students give these presentations

2) Thesis Committee Evaluation of Graduate Student Performance on Thesis Work

Evaluation conditions determined by each thesis committee

3) Faculty Evaluation of Thesis Presentations

These occur as students complete their thesis work

4) Graduate Student Exit Survey

Filled out when a student graduates

The matrix below provides guidance regarding ongoing specific graduate student activities and products that will continue to undergo evaluation to assess whether or not the Department's goals and objectives are being met.

	Graduate Exit Survey	Geology 201 Thesis Proposal	Thesis Presentation	Thesis
Objective 1.1		X	X	X
Objective 2.1		X	X	X
Objective 2.2		X	X	X
Objective 3.1		X		X
Objective 3.2				X
Objective 4.1		X	X	X
Objective 4.2		X	X	X
Objective 4.3			X	
Objective 4.4				X
Objective 5.1				X