MASTER OF SCIENCE IN EARTH AND ENVIRONMENTAL SCIENCES

Graduate Coordinator and Program Advisors can be found in the Graduate Advisors page (https://environment.sfsu.edu/graduate-coordinator-advisors) on the School of the Environment website.

The Master of Science in Earth & Environmental Sciences provides an interdisciplinary MS degree that prepares students for careers in a wide variety of environmental and geoscience professions in private and non-profit industry, government agencies, to teach in community colleges or high schools, and provides a pathway to PhD programs. The graduate program also gives professional geoscientists and environmental scientists an opportunity to update and upgrade their job skills or areas of expertise.

Graduate Teaching Assistantships

To help prepare for their careers, graduate students are strongly encouraged to serve as a Graduate Teaching Assistant (GTA) for at least one semester. GTAs typically teach lab sections attached to lectures in introductory courses in Earth Sciences and Environmental Sciences. To support their professional development in teaching, GTAs are strongly encouraged to enroll in a professional development course such as SCI 750 (2 units) before or during their service as a GTA, to learn about research-based best practices in teaching and learning. The SCI 750 course counts toward the 21-unit graduate elective requirement.

Admission to the Program

For admission to the graduate program, a student must meet the general University requirements as stated in the *Bulletin*. An applicant must have a baccalaureate degree from an accredited institution with a GPA of 3.00 or better in Earth Science, Geology, Environmental Science, Physical Geography, or a related discipline.

Please submit applications through Cal State Apply (https://www2.calstate.edu/apply). Transcripts, a Statement of Purpose, and two letters of recommendation are required. We strongly encourage students to email faculty they are interested in working with, but applicants are not required to identify a faculty research advisor prior to being admitted.

Applicants lacking the appropriate background may be admitted as conditionally classified graduate students. These students must complete additional coursework that will not be counted toward the degree requirements. Conditionally admitted students may take courses but cannot file an Advancement to Candidacy (ATC) form until all deficiencies have been satisfied.

Program Learning Outcomes

On completion of the program, students will be able to:

1. Source, synthesize and articulate the knowledge that is relevant to their field from the current research literature within Earth and environmental sciences.
2. Formulate a research question and develop a detailed methodological plan to address their research question.
3. Apply skills and techniques to collect appropriate Earth and environmental data and evaluate its quality.
4. Use quantitative methods to analyze research data.
5. Write clear, well-organized explanations of their research goals, methods, results, and implications.
6. Present their research ideas in well-constructed, visually effective, and well-articulated presentations.
7. Use skills and experience gained during the degree program to find employment in their field of interest or acceptance into a doctoral program.

Written English Proficiency Requirements

The University has a requirement for written English proficiency that is to be assessed at two different levels.

Level One

Written English proficiency will be assessed on the basis of the Statement of Purpose. Students who demonstrate a need for additional writing support will be required to take a graduate-level writing class.

Level Two

Satisfactory completion of ERTH 897 or ERTH 898 or GEOG 898 .

Advancement to Candidacy

In addition to fulfilling all University requirements, students must complete the required curriculum outlined below. All graduate courses used on the Advancement to Candidacy (ATC), with the exception of ERTH 898 or GEOG 898 , must be taken on a letter grade basis and have earned a B- or better. Each student must consult with an appropriate graduate advisor regularly and design an individual program leading towards the Culminating Experience requirement (thesis). For advancement to candidacy, the student must select a Culminating Experience committee comprised of two or three members, at least two of whom must be faculty from the School, and present a research proposal to the School. Note that Culminating Experience committee members may have specific requirements for methodological background courses, so this should be discussed when planning course schedules.

Upper-division courses offered by the department may be included with the approval of the graduate advisor. Depending on a student's background and/or objective, additional courses in Earth science, environmental science, physical geography, or related fields may be required on advisement.

Earth and Environmental Sciences (M.S.) – 30 units minimum

All graduate courses used on the Advancement to Candidacy (ATC), with the exception of ERTH 898 or GEOG 898, must be taken on a letter grade basis and have earned a B- or better.

Required Courses (6 units)

Code	Title	Units
Select One:		3
ENV 801	Scope and Method in Environmental Research	
ERTH 701	Research Methods in Geosciences	
Select One:		3

ERTH 702	Quantitative Methods in Geosciences
GEOG 705	Statistics for Environmental Analysis

Techniques Course (3-4 units)

Select One:

Code	Title	Units
GEOG 610	Remote Sensing of the Environment I	4
GEOG 625	Programming for Geographic Information Science	3
GEOG 702	Field Methods in Environmental Science & Physical Geography	4
GEOG 704	Environmental Data Science	3
GEOG 711	Remote Sensing of the Environment II	4
GEOG 720	Geographical Information Systems	4
GEOG 721	Geographic Information Systems for Environmental Analysis	4
or other courses with approval of the Graduate Coordinator		

Topical Course (3-4 units)

Select a course from a range of ERTH and GEOG upper-division or paired courses on advisement.

Graduate Seminars in Earth & Environmental Sciences (6 units)

Code	Title	Units
ERTH 795	Selected Topics in the Geosciences	3
GEOG 810	Seminar in Physical Geography	3

Each of the above seminars has multiple topics and each can be repeated when topics vary, though only 6 units can be applied to this requirement.

Graduate Electives (9 units)

Select Three: A different topic for GEOG 810 or ERTH 795 may be used as an elective if not used to meet the Graduate Seminars requirement. Students serving as Graduate Teaching Assistants are encouraged to take SCI 750, and may count that course towards the Elective requirement.

Code	Title	Units
ENV 789	Graduate Internship	3
ENV 815	Seminar in GIScience	3
GEOG 751	Environmental Management	3
GEOG 810	Seminar in Physical Geography	3
or ERTH 795	Selected Topics in the Geosciences	
GEOG 820	Human and Social Geography	3
GEOG 896	Directed Reading in Geography	3
or ERTH 896	Directed Reading in the Geosciences	
GEOG 897	Research Project Formulation	2
or ERTH 897	Research Project	
GEOG 899	Independent Study	1-3
or ERTH 899	Independent Study	

Culminating Experience (3 units)

Select One:

Code	Title	Units
ERTH 898	Master's Thesis	3
GEOG 898	Master's Thesis	3

Master's Oral Examination

An oral examination is required of all students. One hour is devoted to the research topic followed by discussion with the thesis committee. Students must have completed all coursework prior to taking the oral examination which can be scheduled only during the fall and spring semesters. Examination guidelines are available from the graduate coordinator.

Research Proposal

The School requires all MS students to present a proposal of their research for the Culminating Experience to faculty and peers within a semester of filing the Proposal for Culminating Experience. The object is to provide students with useful feedback in the critical developmental stage of the research experience. Students present a twenty-minute synopsis of their research ideas to faculty and fellow students focusing particularly on linking the research to a broader theoretical framework and presenting a methodology design to achieve the specifically stated objectives. This is followed by ten minutes (maximum) for questions and comments. Proposal presentations are scheduled as needed.

Students can receive their graduate degree when they complete all course requirements and their thesis committee approves the written thesis and oral thesis defense.