Earth and Environmental Sciences

The Field of Earth Science

Earth Science (including Geology and Environmental Science) deals with the study of the Earth and its environment, including the oceans, the atmosphere, and the solid earth. Areas of study include plate tectonics, oceans and the atmosphere, mineral and energy resources, ground water, waste disposal, fossils and evolution, volcanoes and earthquakes, mountain building and erosion, the Earth's history and how these affect human existence, and the effect of humans on natural earth systems. Earth science is an exciting and rewarding field of scientific investigation.

Careers in Earth Science

Earth Scientists are employed as professionals as well as research scientists and educators. Earth science graduates find employment in the energy mineral exploration, oil and gas exploration, land-use planning, engineering geology, water, resource evaluation, environmental assessment, toxic waste cleanup, groundwater contamination, teaching science, and research. Today's earth scientists find themselves working on a variety of problems scattered across the oceans and continents of the globe. Geology and Environmental Science have been identified as high priority occupations of the 21st century. Advanced degrees are often necessary for employment in industry, government, and academic institutions. Teaching at the secondary level requires a credential. Teaching positions at the community college level generally requires a master's degree.

The Department of Earth and Environmental Sciences

The Earth and Environmental Sciences at California State University, Fresno offers coursework and research that emphasize field and laboratory investigations of a wide variety of geologic and environmental problems.

The program takes advantage of Fresno's proximity to the Sierra Nevada, the California Coastal Ranges, the Pacific Coast, and the Basin and Range province.

The Bachelor of Science is designed for students who want to study geology to prepare for employment in industrial mineral and energy exploration, environmental protection, land- use planning, and engineering geology, or for those wishing to pursue graduate work. The Bachelor of Arts in Natural Sciences, Earth Science Emphasis is designed primarily for students who wish to teach earth or physical science at the secondary level. This degree is also a suitable choice for students with a general interest in earth science and a career in environmental science, law, land- use planning, or natural resource- related business.

The Master of Science in Geology is designed primarily for those who are seeking employment as professional geologists or environmental specialists in engineering or groundwater geology, mineral and energy exploration, or other areas. Graduates of the California State University, Fresno M.S. program have the highest pass rate on the California State Registration Exam for Geologists. The Department of Earth and Environmental Sciences is located in Science II. Students also have access to the university's special laboratories, computers and other modern equipment. Fresno State participates in the management of the Moss Landing Marine Laboratory in Monterey Bay. Regular course work is offered there as well as opportunities for research.

High School Preparation

Students should meet California State University's admission requirements in terms of college preparatory course requirements, grade point average, and test scores. Those students with an interest in geology should take courses in math, such as algebra (two years), plane geometry, and trigonometry; courses in the sciences, such as chemistry, physics and biology; and four years of English.

California State University, Fresno

Department of Earth and Environmental Sciences

559.278.3086

B.S. in Geology

B.S. in Environmental Sciences

B.A. in Natural Sciences

Teaching Credential Option:

- ***Earth Science***

M.S. in Geology

Minor in Geology

FRESNO STATE

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Earth and Environmental Sciences

College Program

Students should consult the university's *General Catalog* for specific major and university requirements. Community college transfers should consult their catalogs to ensure that courses taken are CSU transferable (baccalaureate level).

General Education

Students should complete as many of the Fresno State General Education requirements as possible during the freshman and sophomore years, whether they are attending California State University, Fresno or a community college. Community colleges can certify up to 39 of the 54 units required in Fresno State's General Education pattern.

Course Requirements

Since changes may occur, students should consult the *General Catalog* and a California State University, Fresno adviser prior to registering for courses.

Geology

Lower Division

Freshman-Sophomore level courses
(may be taken at a community college)

Physical Geology and Historical Geology (EES 1 and 2)
Mineralogy (EES 12)
Introductory Field Methods (EES 30)
General Chemistry and Quantitative Analysis (CHEM 1A-B)
General Physics (PHYS 2A-B)
Mathematical Analysis I and II (MATH 75-76)

Upper Division

Junior-Senior level courses
(to be taken at Fresno State)

Advanced Field Methods (EES 107)
Geostatistics (EES 178
Geomorphology (EES 105)
Igneous and Metamorphic Petrology (EES 101)
Invertebrate Paleontology (EES 110)
Analytical Methods in the Earth Sciences (EES 100)
Scientific Writing/ Research Techniques (EES 104)
Sedimentology (EES 102)
Stratigraphy (EES 122)
Structural Geology (EES 106)
Undergraduate Thesis (EES 199)
Approved Electives

Environmental Science

Lower Division

Freshman-Sophomore level courses
(may be taken at a community college)

Physical Geology and Historical Geology (EES 1)
Environmental Science (EES 4)
Introductory Field Methods (EES 30)
General Chemistry and Quantitative Analysis (CHEM 1A-B)
General Physics (PHYS 2A-B)
Mathematical Analysis I and II (MATH 75-76)
Introduction to Environmental Science (PLSI 71)

Upper Division

Junior -Senior level courses
(to be taken at Fresno State)
General Ecology (BIOL 101)
Soil and Water Sciences (EES 108)
Atmospheric Sciences (EES 109)
Environmental GIS (EES 186)
Global Paleoclimates (EES 125 or EES 126)
Environmental Politics (PLSI 157)
Undergraduate Thesis (EES 199)
Approved Electives

Approved Electives

Courses such as the following:
Applied Geophysics (EES 118)
Engineering Geology (EES 114)
Geochemistry (EES 124)
Hydrology (EES 117)
Paleoclimate (EES 126)
Remote Sensing for the Natural Sciences (EES 185)
Earth Science Applications of GIS (EES 186)
Computer Applications in Geology (EES 180)
Stream Habitat Restoration (EES 113)

For additional information, write

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Department of Earth and Environmental Sciences

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