EARTH SCIENCE, BACHELOR OF SCIENCE

Requirements

Total Course Requirements for the Bachelor's Degree

See the "Requirements for the Bachelor's Degree (https://catalog.csudh.edu/general-information/baccalaureate-degrees-undergraduate-studies/)" in the University Catalog for complete details on general degree requirements. A minimum of 40 units, including those required for the major, must be upper division.

Elective Requirements

Completion of elective courses (beyond the requirements listed below) to reach a total of a minimum of 120 units.

General Education Requirements (43 units)

See the "General Education (https://catalog.csudh.edu/general-education/)" requirements in the University Catalog or the Class Schedule for the most current information on General Education requirements and course offerings.

Graduation Writing Assessment Requirement (3 Units)

See the "Graduation Writing Assessment Requirement (https://catalog.csudh.edu/general-information/baccalaureate-degrees-undergraduate-studies/gwar-certifying-courses/)" section in the University Catalog.

Statutory Requirements: United States History, Constitution and American Ideals (6 Units)

See the "University Graduation Requirements (https://catalog.csudh.edu/general-information/baccalaureate-degrees-undergraduate-studies/university-graduation-requirements/)" section in the University Catalog.

Minor Requirements

Students completing this major are not required to complete a minor in another field.

Major Requirements (58-63 units)

Code	Title	Hours
Lower Division Required Courses		
EAR 100	Physical Geology	3
or GEO 200	Physical Geography	
EAR 101	Physical Geology Laboratory	1
EAR 200	Earth History and Evolution	3
EAR 201	Earth History Lab	1
Select one of the following:		7-10
MAT 131 & MAT 171	Elementary Statistics and Probability and Survey of Calculus for Management and Life Sciences	
MAT 191 & MAT 193	Calculus I and Calculus II	
Select one of the following options:		8-10
Option 1:		
CHE 110 & CHE 112	General Chemistry I and General Chemistry II	
Option 2:		
PHY 120 & PHY 122	Elements Of Physics I and Elements Of Physics II	
Option 3:		
BIO 120 & BIO 121	Principles of Biology I and Principles of Biology Laboratory I	
BIO 122 & BIO 123	Principles of Biology II and Principles of Biology Laboratory II	
Upper Division Required Courses		
EAR 370	The World Ocean	3
EAR 376	Field Mapping	3
EAR 410	Environmental Geology	3
EAR 450	Plate Tectonics and the Rock Cycle	4
EAR 460	Global Change	3
EAR 490	Sr Sem In Earth Sciences	1
GEO 370	Numerical Methods in Geography	3
GEO 412	Rivers and Streams	3
GEO 415	Geographic Information Systems	3
Select nine units from the following:		9
EAR 476	Groundwater	
GEO 310	Geomorphology	
GEO 315	The Weather	
GEO 357	Urban Environmental Geography	
GEO 380	Biogeography	
GEO 408	Remote Sensing and Image Processing	
GEO 416	Earth's Climates	
GEO 420	Natural Resources	
GEO 433	Environmental Analysis and Planning	
EAR 495	Advanced Top In Ear Sci	
EAR 496	Internship In Earth Sci	
Total Hours		**58-63**

- Geographic Literacy: Students will apply their knowledge of the world's geography by interpreting topographic and thematic maps. They will demonstrate their ability to think geographically by analyzing geographic problems at a variety of scales.
- Environmental Processes: Students will demonstrate their understanding of the utilization and distribution of key natural resources. This will include fundamental transport processes such as the hydrologic cycle, the rock cycle, and circulations through the world ocean and global atmosphere and their relationship to contemporary environmental issues.
- Geotechniques: Students will demonstrate their understanding of geotechniques such as GIS, remote sensing, spatial statistics, and field maps. Students will apply spatial statistics and other forms of numerical analysis to interrogate existing and original geographical data sets.
- Field Experience: Students will apply field research techniques toward the completion of field mapping and other data collection exercises.
- Written and Oral Communication: Students will demonstrate their ability to describe research and to summarize research results in essays, written reports and oral presentations.
- Group Activities: Students will be able to work together in small groups to collect and analyze classroom/field data and they will demonstrate their ability to collaborate with other students to deliver research presentations.

- Professional Preparation: Students will hone research skills and work on research projects which reflect their command of the subject matter and its relevance to contemporary environmental issues, as well their command of geotechniques and their application. The research projects prepare students for graduate school and/or the workforce, and can be used as examples of the kinds of knowledge and expertise that they could bring to prospective employers.

4-Year Degree Roadmap

4-Year Degree Roadmap

First Year		
Fall		**Hours**
GE Area 1A English Composition		3
GE Area 1B Critical Thinking		3
GE Area 3A Arts		3
GE Area 4A Social and Behavioral Sciences		3
Free elective		3
	Hours	**15**
Spring		
GE Area 1C Oral Communication		3
MAT 131 or MAT 132 or MAT 134 or MAT 191	Elementary Statistics and Probability (Satisfies GE Area 2 Mathematical Concepts and Quantitative Reasoning) or Statistics and Probability with Support or Statistics & Probability - Supported or Calculus I	3-5
EAR 100 or GEO 200	Physical Geology (Satisfies GE Area 5A Physical Sciences) or Physical Geography	3
EAR 101	Physical Geology Laboratory (Satisfies GE Area 5C Laboratory)	1
GE Area 3B Humanities		3
Free elective (If enrolled in MAT 191, elective not necessary this term)		2
	Hours	**15-17**
Second Year		
Fall		
GE Area 5B Biological Science (incl. BIO 120/121)		3-4
MAT 171 or MAT 193	Survey of Calculus for Management and Life Sciences or Calculus II	4-5
GE Area 4B Social and Behavioral Sciences		3
HIS 101	History Of United States	3
Free elective (If enrolled in BIO 120/121 and MAT 193, elective not necessary this term)		2
	Hours	**15-17**
Spring		
EAR 200	Earth History & Evolution	3
EAR 201	Earth History Lab	1
GE Area 6 Ethnic Studies		3
POL 101	American Institutions	3
Free electives		5
	Hours	**15**
Third Year		
Fall		
GEO 415	Geographic Information Systems	3
EAR 410	Environmental Geology	3
EAR 460	Global Change	3
CHE 110 or PHY 120 or BIO 120	General Chemistry I or Elements Of Physics I or Principles of Biology I	4-5
Major elective		3
	Hours	**16-17**
Spring		
GEO 370	Numerical Methods in Geography	3
EAR 450	Plate Tectonics and the Rock Cycle	4
CHE 112 or PHY 120 or BIO 122	General Chemistry II or Elements Of Physics I or Principles of Biology II	4-5
GE Area 5 UD Integrative Studies in the Physical and Biological Sciences		3
	Hours	**14-15**
Fourth Year		
Fall		
EAR 370	The World Ocean	3
EAR 376	Field Mapping	3
Major elective		3
GE Area 4 UD Integrative Studies in the Social and Behavioral Sciences		3
GWAR-certifying course		3
	Hours	**15**
Spring		
GEO 412	Rivers and Streams	3
EAR 490	Sr Sem In Earth Sciences	1
Major elective		3
GE Area 3 UD Integrative Studies in the Arts and Humanities		3
Free electives		5
	Hours	**15**
	Total Hours	**120-126**

2-Year Roadmap

2-Year Roadmap (transfer students)

First Year		
Fall		**Hours**
GEO 415	Geographic Information Systems	3
EAR 410	Environmental Geology	3
EAR 460	Global Change	3
CHE 110 or PHY 120 or BIO 120	General Chemistry I or Elements Of Physics I or Principles of Biology I	4-5
Major elective		3
	Hours	**16-17**
Spring		
GEO 370	Numerical Methods in Geography	3
EAR 450	Plate Tectonics and the Rock Cycle	4
CHE 112 or PHY 122 or BIO 122	General Chemistry II or Elements Of Physics II or Principles of Biology II	4-5
GE Area 5 UD Integrative Studies in the Physical and Biological Sciences		3
	Hours	**14-15**
Second Year		
Fall		
EAR 370	The World Ocean	3
EAR 376	Field Mapping	3
Major elective		3
GE Area 4 UD Integrative Studies in the Social and Behavioral Sciences		3
GWAR-certifying course		3
	Hours	**15**
Spring		
GEO 412	Rivers and Streams	3
EAR 490	Sr Sem In Earth Sciences	1
Major elective		3
GE Area 3 UD Integrative Studies in the Arts and Humanities		3
Free electives		5
	Hours	**15**
	Total Hours	**60-62**