

GEOLOGY

DEPARTMENT OFFICE

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Programs Offered

Bachelor of Science in Geology
Bachelor of Arts in Geology
Minor in Geology
Minor in Paleontology
Secondary Education Teaching Credential Preparation

Geology is the study of the materials, structures, processes, and history of the earth. Philosophically, it allows us to realize our place in the physical universe within the enormity of geologic time. Practically, it leads to understanding of earth processes, the formation of rocks and minerals, and the energy supplies and materials that support our civilization.

The evolution of modern geologic thought was based on field studies; thus, geology is primarily a field science. The basis for field analysis is a firm background in the principles of geology. The department is committed to undergraduate training that includes a well-balanced treatment of geologic principles, with an emphasis on field studies. Students take a fundamental curriculum that concentrates on the analysis of rocks and minerals, geologic mapping, and report writing. Techniques of field study are part of the fundamental curriculum. Six field-mapping classes are required. Required courses in physics, chemistry, and mathematics support understanding of geologic principles.

Careers in Geology

Within the general field of geology, students may choose from

major programs that lead to either the B.A. or B.S. pre-professional degrees. The B.S. and B.A. degrees provide an excellent background for graduate school and for work in geology in such fields as engineering geology, environmental geology, hydrology, and mineral exploration. Many of our geology graduates work for consulting firms with specialties in one or more of these areas. Because of the selectivity involved in choosing a program that meets their own particular interests and goals, students must consult with a departmental advisor about their plan of study and their course load each semester.

Bachelor of Science in Geology

This plan is intended to give the student basic professional competence in geology. It provides an excellent foundation for graduate school or a professional career for those students who have or desire a strong background in mathematics.

Degree Requirements	Units
General education	51
Major requirements	46
Supporting courses	26
General electives	1
Total units needed for graduation	124

Major Core Requirements

GEOL 205 Mineralogy	2
GEOL 303 Advanced Principles of Geology	4
GEOL 304 Geologic Mapping and Report Writing	1
GEOL 305 Optical Mineralogy	3
GEOL 307 Igneous and Metamorphic Petrology	4
GEOL 308 Igneous and Metamorphic Field	1
GEOL 411 Sedimentary Petrology	4
GEOL 412 Sedimentary Petrology Field	1
GEOL 413 Paleontology	4
GEOL 417 Structural Geology	4
GEOL 418 Structural Geology Field	1
GEOL 420 Field Geology	4
GEOL 427 Advanced Field Geology	4
Total units in the major core	37

Major Electives

Choose 9 units of upper-division geology electives in consultation with an advisor.

Total units in major electives 9

Required Supporting Courses

CHEM 115AB General Chemistry	10
PHYS 114 Introduction to Physics I	4
PHYS 116 Introductory Laboratory	1
PHYS 214 Introduction to Physics II	4
PHYS 216 Introductory Laboratory	1

MATH 161 Calculus I with Analytic Geometry	4
MATH 211S Calculus II with Analytic Geometry (MATH 211 is the 4-unit version of 211S and is highly recommended)	2
Total units in supporting courses	26
Total units in the major	72

Sample Four-year Plan for Bachelor of Science in Geology*

FRESHMAN YEAR:: 28 Units

<i>Fall Semester (14 Units)</i>	<i>Spring Semester (14 Units)</i>
GEOL 102 (3)	GEOL 105** (3)
CHEM 115A (5)	CHEM 115B (5)
GE (6)	
GE (6)	

SOPHOMORE YEAR:: 33 Units

<i>Fall Semester (17 Units)</i>	<i>Spring Semester (16 Units)</i>
GEOL 303 (4)	GEOL 413 (4)
GEOL 304 (1)	GEOL 414 (1)
GEOL 205 (2)	MATH 211S (2)
MATH 161 (4)	GE (9)
GE (6)	

JUNIOR YEAR:: 31 Units

<i>Fall Semester (16 Units)</i>	<i>Spring Semester (15 Units)</i>
GEOL 305 (3)	GEOL 307 (4)
PHYS 114 (4)	GEOL 308 (1)
PHYS 116 (1)	PHYS 214 (4)
GEOL 417 (4)	PHYS 216 (1)
GEOL 418 (1)	GE (3)
GE (3)	Elective (2)

SENIOR YEAR:: 30 Units

<i>Fall Semester (14 Units)</i>	<i>Spring Semester (16 Units)</i>
GEOL 411 (4)	GEOL 420 (4)
GEOL 412 (1)	Geology Elective (3)
Geology Elective (3)	Geology Elective (3)
GE (6)	GE (6)

SENIOR SUMMER:: 4 Units

GEOL 427 (4)

TOTAL SEMESTER UNITS:: 124

* the B.A. degree in geology is identical to the BS, except that MATH 211S is not required, and PHYS 210AB and PHYS 211AB (Algebra Physics) are substituted for PHYS 114, 116, 214, and 216 (Calculus Physics).

** Course not required, but strongly recommended.

Students are strongly encouraged to take GE courses in the summer and in January intersession to the extent possible.

Bachelor of Arts in Geology

This plan is intended to give the student basic professional competence in geology, and is suitable as a foundation for either graduate school or a professional career. The geology course content is the same as in the BS degree, but the calculus and physics requirements are less rigorous.

Degree Requirements	Units
General Education	51
Major Requirements	46
Supporting Courses	22
General Electives	7
Total units needed for graduation	120

Major Core Requirements

GEOL 205 Mineralogy	2
GEOL 303 Advanced Principles of Geology	4
GEOL 304 Geologic Mapping and Report Writing	1
GEOL 305 Optical Mineralogy	3
GEOL 307 Igneous and Metamorphic Petrology	4
GEOL 308 Igneous and Metamorphic Field	1
GEOL 411 Sedimentary Petrology	4
GEOL 412 Sedimentary Petrology Field Course	1
GEOL 413 Paleontology	4
GEOL 417 Structural Geology	4
GEOL 418 Structural Geology Field	1
GEOL 420 Field Geology	4
GEOL 427 Advanced Field Geology	4

Total units in the major core 37

Major Electives

Choose 9 units of upper-division geology electives in consultation with an advisor.

Total Units in Major Electives 9

Required Supporting Courses

CHEM 115AB General Chemistry	10
PHYS 209AB, 210AB General Physics with Laboratory	8
MATH 161 Calculus I with Analytical Geometry	4

Total units in supporting courses 22

Total units in the major 68

Minor in Geology

Completion of a minimum of 20 units from Geology Department courses will constitute a minor in geology. Six of the 20 units must be upper-division. Students should consult with an advisor in the Geology Department regarding required courses.

Minor in Paleontology

PROGRAM COORDINATOR

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Minor in Paleontology

The Minor in Paleontology offers students from any major on the SSU campus a cross-disciplinary concentration in the study of ancient life on Earth. Paleontology is by its very nature an interdisciplinary field of study, blending both laboratory and field studies of modern organisms and extinct organisms. Some paleontologists approach the field from a geological perspective, and others approach it from a biological perspective. For a Minor in Paleontology, students must complete 20 units as described below.

Minor Core Requirements

	<i>Units</i>
GEOL 102 Our Dynamic Earth	3
GEOL 413 Paleontology	4
BIOL121 Diversity, Structure, and Function, or	
BIOL 122 Genetics, Evolution, and Ecology	4
Total units in the minor core	11

Minor Electives

In addition to the Minor Core, choose 9 units of electives from other paleontology courses and/or courses with an emphasis on interpreting the history of life on Earth, and at least 1 unit that is a field course (marked by asterisk below). All SSU majors may select the Minor in Paleontology, and if you are majoring in either Biology or Geology, at least 3 upper division elective units must be from outside your home department. Additional courses may be counted toward the minor with approval of one of the minor advisors above. The 9 elective units must include at least one 4-unit upper division course with a laboratory from the following list:

* Field courses – one course is required for the minor

† 4-unit laboratory courses – one course is required for the minor

ANTH 301 Human Fossils and Evolution	4
†ANTH 415 Forensic Anthropology	4
†BIOL 220 Human Anatomy	4
†BIOL 322 Invertebrate Biology	4
†BIOL 327 Vertebrate Biology	4
†BIOL 328 Vertebrate Evolution and Morphology	4
BIOL 310 Dinosaurs	3

GEOG 370 Weather and Climate	4
GEOG 372 Climate Change	4
GEOL 105 The Age of Dinosaurs	3
†GEOL 303 Advanced Principles of Geology	4
*GEOL 304 Geologic Mapping and Report Writing	1
†GEOL 326 Stratigraphy and Earth History	4
*GEOL 414 Paleontology Field Course	1
GEOL [496] Paleoclimates	3
*GEOL [496] Burgess Shale Paleontology	3

Total elective units in the minor 9

[] = courses that will have newly-proposed number changes in the near future, pending approval

Some of these elective courses above might have additional prerequisites not listed here. Refer to the University catalog for additional information.

Total units for the paleontology minor 20

Secondary Education Teaching Credential Preparation

Geology students must demonstrate competence in the natural sciences by passing the subject matter examination required by the *California Commission on Teacher Credentialing*. One part of the examination will test breadth of knowledge in biology, chemistry, physics, astronomy, and geology. Another part of the examination will test depth of knowledge in a particular area, such as geology. The BA or BS degree in geology is recommended to prepare for the part of the examination that tests depth of knowledge in geology. For recommended course selection to help prepare for the part of the examination that tests breadth of scientific knowledge, please see the Teaching Credential section of the SSU catalog.

For more information, please contact Professor Dan Karner, Darwin Hall 124, (707) 664-2334.

Department Policy on Independent Study

1. The student must have a 3.00 or higher grade point average.
2. The student must have demonstrated ability to work independently and do quality work in field classes.
3. The student must have submitted a detailed proposal of work, a schedule, and the results expected.
4. The student must have a faculty sponsor who is willing to advise the project and will set up a schedule of meetings for this purpose. This will be reported on the standard University Special Studies form and signed by the student, faculty advisor, and department chair.
5. A copy of all documents and two copies of the final paper or report will be filed with the department office before a grade will be assigned.