GEOLOGY, BACHELOR OF SCIENCE

College of Letters & Science

"Civilization exists by geological consent—subject to change without notice." — Will Durant

Geology is the study of the Earth, and in particular its history, structure, and the processes that have molded our planet and its biosphere. Geology involves the origin of continents & ocean basins, earthquakes & volcanoes, variations in global climate, and how these physical changes impact the evolution of life. All of these planetary processes are viewed through the prism of "deep time," a perspective unique to geologists and one that distinguishes geology from most of the other physical sciences.

A significant component of geology is oriented toward the interaction between humans and the Earth. This aspect includes the study of resources such as minerals, oil, and water; identification & mitigation of Earth hazards such as earthquakes, landslides, floods, and volcanic eruptions; identification & mitigation of polluted ground water; land use planning; and the study of ancient & modern climate change.

The Program

Students interested in becoming professional geologists or continuing their geological studies at the graduate level should choose the Bachelor of Science degree program. The Bachelor of Arts program is for students interested in an interdisciplinary program of study, or who plan to go into pre-college teaching. The upper division electives are not restricted to geology courses but must be chosen to provide a relevant, coherent, and in-depth program of study.

Undergraduate Research

The geosciences span many disciplines at UC Davis, and students have opportunities to participate in undergraduate research (https://eps.ucdavis.edu/students/undergrad/gel/research) in a variety of interest areas. Many students choose to complete a senior thesis to develop their research and writing skills during their senior year.

Internships & Careers

A degree in Geology provides students with knowledge and practical experience needed to pursue careers (https://eps.ucdavis.edu/students/careers) in the geosciences (government, private sector, research, teaching). The major program includes flexibility to participate in research, internships, and fieldwork to help prepare students for these career paths. The requirements for a B.S. in Geology satisfy the coursework required for the Professional Geologist licensing process in the State of California.

Global Learning in Geology

Consider studying or interning abroad through programs available through the Global Learning Hub (https://eps.ucdavis.edu/students/undergrad/gel/studyabroad).

Get Involved

Find your community (https://eps.ucdavis.edu/students/undergrad/gel/involved) through clubs, events, seminars, and workshops relating to geoscience.

Graduation Honors

Students graduating from the College of Letters & Science are eligible for Departmental Honors, depending on their GPA and whether or not they complete a Senior Thesis. Students who graduate with a GPA in the top percentages of their college (https://catalog.ucdavis.edu/academic-information-policies-regulations/honors-prizes/) will automatically graduate with Honors. Students who qualify for Honors at graduation may also be eligible for High Honors or Highest Honors, based upon the quality of their Senior Thesis (https://eps.ucdavis.edu/students/undergrad/gel/research) (course number 194A-194B) or Senior Honors Thesis (course number 194HA-194HB). It is Department of Earth and Planetary Sciences policy that an "A-" grade on the thesis will earn the student High Honors, and an "A" grade will earn the student Highest Honors.

Advising

Visit the staff major advisor (https://eps.ucdavis.edu/students/undergrad/advising) for help navigating major requirements and planning for your degree. Visit the faculty major advisors (https://eps.ucdavis.edu/students/undergrad/advising) for additional advice on courses, careers, and graduate school.

Faculty Advisors

R. Motani, D. A. Osleger, M. Rudolph.

Visit the College of Letters & Science advisors (https://lettersandscience.ucdavis.edu/advising) for help navigating university requirements (https://catalog.ucdavis.edu/undergraduate-education/university-degree-requirements/) and college requirements (https://catalog.ucdavis.edu/academic-information-policies-regulations/college-major-minor-information/).

Graduate Study

The coursework, research and internship opportunities, and fieldwork requirements in the Geology major help prepare students to enter graduate programs (https://eps.ucdavis.edu/students/careers/gradschool) to continue their studies and prepare for their career. Students should meet with advisors and faculty to build a strong application for graduate school through additional independent research or other co-curricular involvements.

The major requirements below are in addition to meeting University Degree Requirements (https://catalog.ucdavis.edu/undergraduate-education/university-degree-requirements/) & College Degree Requirements (https://catalog.ucdavis.edu/undergraduate-education/college-degree-requirements/); unless otherwise noted. The minimum number of units required for the Geology Bachelor of Science is 104.

Code	Title	Units
Preparatory Subject Matter		
Geology		
GEL 050	Physical Geology (Discontinued for fall 2026) **	3
or EPS 050	Physical Geology	
GEL 050L	Physical Geology Laboratory (Discontinued for fall 2026) **	2
or EPS 050L	Physical Geology Laboratory	
GEL 053	Introduction to Geobiology (Discontinued for fall 2026) **	3
or EPS 142	Geobiology & Geomicrobiology	

or EPS 003	History of Life	
or GEL 003 DISCONTINUED FOR WINTER 2026 **		
GEL 055	(Discontinued for winter 2026) **	3-5
or CHE 002C	General Chemistry	
or CHE 004C	General Chemistry for the Physical Sciences & Engineering	
GEL 056	(Discontinued for winter 2026) **	4-5
or PHY 007C	General Physics	
or PHY 009C	Classical Physics	
or PHY 009HC	Honors Physics	
GEL 060	Earth Materials: Introduction (Discontinued for fall 2026) **	4
Mathematics		
Choose a series:		11-12
MAT 016A & MAT 016B DISCONTINUED FOR SPRING 2025 ** & MAT 016C DISCONTINUED FOR SPRING 2025 ** & MAT 022A	and and and Linear Algebra (Discontinued for spring 2025 **)	
OR		
MAT 017A & MAT 017B & MAT 017C	Calculus for Biology & Medicine and Calculus for Biology & Medicine and Calculus for Biology & Medicine	
OR		
MAT 019A & MAT 019B & MAT 019C & MAT 022A	Calculus for Data-Driven Applications and Calculus for Data-Driven Applications and Calculus for Data-Driven Applications and Linear Algebra	
OR		
MAT 021A & MAT 021B & MAT 022A	Calculus and Calculus and Linear Algebra	
OR		
MAT 021A & MAT 021B & MAT 021C	Calculus and Calculus and Calculus	
Chemistry		
Choose a series:		10
CHE 002A & CHE 002B	General Chemistry and General Chemistry	
CHE 004A & CHE 004B	General Chemistry for the Physical Sciences & Engineering and General Chemistry for the Physical Sciences & Engineering	
Statistics		
Choose one:		4
STA 013	Elementary Statistics	
or STA 013V	Elementary Statistics	
or STA 013Y	Elementary Statistics	
STA 032	Gateway to Statistical Data Science	
STA 100	Applied Statistics for Biological Sciences	
Physics		
Choose a series:		8-10
PHY 007A & PHY 007B	General Physics and General Physics	
PHY 009A & PHY 009B	Classical Physics and Classical Physics	
PHY 009HA & PHY 009HB	Honors Physics and Honors Physics	
Preparatory Subject Matter Subtotal		52-58
Depth Subject Matter		
Geology Courses		
EPS 102	Structural Geology	3
or GEL 101 DISCONTINUED FOR FALL 2026 **		
EPS 102L	Structural Geology Lab	2
or GEL 101L DISCO		
EPS 105	Igneous Rocks & Magmatic Processes	4
or GEL 105 DISCONTINUED FOR FALL 2026 **		
EPS 109	Sediments & Strata	3
or GEL 109 DISCON		
EPS 109L	Sediments & Strata Laboratory	2
or GEL 109L DISCONTINUED FOR FALL 2026 **		
GEL 103	Field Geology	4
GEL 107	Earth History: Paleobiology (Discontinued for fall 2026) **	3
or EPS 107	Paleobiology	
GEL 107L	Earth History: Paleobiology Laboratory (Discontinued for fall 2026) **	2
or EPS 107L	Paleobiology Laboratory	
GEL 108	Earth History: Paleoclimates (Discontinued for fall 2026) **	3
or EPS 108	Paleoclimatology	
Upper Division Electives		
Choose 18 units:		18
Choose from courses GEL 130-GEL 194 or pre-selected non-GEL courses. Only one of GEL 181/EDU 181 or GEL 183/EDU 183 or GEL 185A or 185B or 186 may be applied toward elective credit. Pre-selected non-GEL courses in related fields: CHE 100, ECI 171/ECI 171L, ECI 175, ESM 100, ESM 186, ESP 152, HYD 144, HYD 146, LDA 150/ABT 150, SSC 100, WFC 102. Other courses in related fields must be approved in advance by the major advisor. No more than 3 units of upper division elective credit for courses GEL 115-GEL 120. No more than 6 units of upper division elective credit for GEL 192 or GEL 194A-GEL 194B or GEL 194HA-GEL 194HB. Students who receive approval to do a senior thesis for part of the capstone requirement may not use GEL 194A-GEL 194B or GEL 194HA-GEL 194HB for the upper division elective courses.		
GEL 130	(Discontinued for winter 2026) **	
GEL 131	Risk: Natural Hazards & Related Phenomena (Discontinued for fall 2026) **	
or EPS 131	Risk, Natural Hazards, & Related Phenomena	
GEL 132	Introductory Inorganic Geochemistry (Discontinued for winter 2026) **	
or EPS 132	Introductory Inorganic Geochemistry	
GEL 133	Environmental Geochemistry (Discontinued for fall 2026) **	
or EPS 133	Environmental Geochemistry	

GEL 134	Environmental Geology & Land Use Planning (Discontinued for fall 2026) **
or EPS 134	Environmental Geology & Land Use Planning
GEL 136	Ecogeomorphology of Rivers & Streams (Discontinued for fall 2026) **
or EPS 136	Ecogeomorphology of Rivers & Streams
GEL 138	Introductory Volcanology (Discontinued for fall 2026) **
or EPS 138	Introductory Volcanology
GEL 139	(Discontinued for winter 2026) **
GEL 140	Introduction to Process Geomorphology (Discontinued for fall 2026) **
or EPS 140	Introduction to Geomorphology & Earth-Surface Processes
GEL 141	Evolutionary History of Vertebrates (Discontinued for fall 2026) **
or EPS 141	Evolutionary History of Vertebrates
GEL 142	(Discontinued for winter 2026) **
or EPS 142	Geobiology & Geomicrobiology
GEL 143	(Discontinued for winter 2026) **
GEL 144	Historical Ecology (Discontinued for fall 2026) **
or EPS 144	Historical Ecology
GEL 145	(Discontinued for winter 2026) **
GEL 146	Radiogenic Isotope Geochemistry & Cosmochemistry (Discontinued for fall 2026) **
or EPS 146	Radiogenic Isotope Geochemistry & Cosmochemistry
GEL 147	(Discontinued for winter 2026) **
GEL 148	Stable Isotopes & Geochemical Tracers
GEL 149	(Discontinued for winter 2026) **
GEL/ESP 150A	Physical & Chemical Oceanography
GEL 150B/ ESP 150B DISCONT	Geological Oceanography (Discontinued for fall 2026) **
or EPS 150B	Geological Oceanography
GEL 150C/ ESP 150C DISCONTINUED FOR FALL 2026 **	Biological Oceanography (Discontinued for fall 2026) **
or EPS 150C	Biological Oceanography
GEL 152	(Discontinued for winter 2026) **
GEL 156	(Discontinued for winter 2026) **
GEL 160	Geological Data Analysis (Discontinued for fall 2026) **
or EPS 160	Introduction to Modeling for Earth & Environmental Science
GEL 161	Geophysical Field Methods (Discontinued for fall 2026) **
or EPS 161	Geophysical Field Methods
GEL 162	Geophysics of the Solid Earth (Discontinued for fall 2026) **
or EPS 162	Geodynamics
GEL 163	Planetary Geology & Geophysics (Discontinued for fall 2026) **
or EPS 163	Planetary Geology & Geophysics
GEL 175	Advanced Field Geology (Discontinued for fall 2026) **
or EPS 175	Advanced Field Geology
GEL/EDU 181	Teaching in Science & Mathematics
GEL 182	(Discontinued for winter 2026) **
or EPS 176	Field Studies in Marine Geochemistry
GEL/EDU 183	Teaching High School Mathematics & Science
GEL 185A	(Discontinued for winter 2026) **
GEL 185B	(Discontinued for winter 2026) **
GEL 186	Facilitating Learning in STEM Classrooms (Discontinued for fall 2026) **
or EPS 186	Facilitating Learning in STEM Classrooms
GEL 190	(Discontinued for winter 2026) **
GEL 192	Internship in Geology (Discontinued for fall 2026) **
or EPS 192	Internship for Upper Division Students
GEL 194A	Senior Thesis (Discontinued for fall 2026) **
or EPS 194A	Senior Thesis
GEL 194B	Senior Thesis (Discontinued for fall 2026) **
or EPS 194B	Senior Thesis
GEL 194HA	Senior Honors Project (Discontinued for fall 2026) **
or EPS 194HA	Senior Honors Thesis
GEL 194HB	Senior Honors Project (Discontinued for fall 2026) **
or EPS 194HB	Senior Honors Thesis
CHE 100	Environmental Water Chemistry
EDU/GEL 181	Teaching in Science & Mathematics
EDU/GEL 183	Teaching High School Mathematics & Science
ECI 171	Soil Mechanics
ECI 171L	Soil Mechanics Laboratory
ECI 175	Geotechnical Earthquake Engineering
ESM 100	Introduction to Water Science
ESM 186	Environmental Remote Sensing
ESP 152	Coastal Oceanography
HYD/EBS 144	Groundwater Hydrology
HYD 146	(Discontinued for winter 2026) **
LED/ABT 150/ LDA 150 DISCONTI	Introduction to Geographic Information Systems
SSC 100	Principles of Soil Science
WFC 102	Field Studies in Fish Biology

Capstone

Choose two summer field courses. A senior thesis may only be substituted for one of the summer field courses with the consent of the thesis advisor and an undergraduate advisor. The decision to undertake a thesis in lieu of a summer field course must be declared by the end of the spring term of a student's junior year.	8-10

Choose two:

GEL 110A	Summer Field Geology: Structures & Neotectonics (Discontinued for fall 2026) **
or EPS 110A	Summer Field Geology: Structures & Neotectonics

GEL 110B	Summer Field Geology: Volcanology (Discontinued for fall 2026) **	
or EPS 110B	Summer Field Geology: Igneous Rocks	
GEL 110C	Summer Field Geology: Special Projects (Discontinued for fall 2026) **	
or EPS 110C	Summer Field Geology: Special Projects	
GEL 194A & GEL 194B DISCONTINUED FOR FALL 2026 **	Senior Thesis and (Discontinued for fall 2026) **	
OR		
EPS 194A & EPS 194B	Senior Thesis and Senior Thesis	
GEL 194HA & GEL 194HB DISC	Senior Honors Project and (Discontinued for fall 2026) **	
OR		
EPS 194HA & EPS 194HB	Senior Honors Thesis and Senior Honors Thesis	
Depth Subject Matter Subtotal		52-54
Total Units		**104-112**

** Course(s) discontinued; see your advisor for course options.