

BS IN GEOLOGY (ENVIRONMENTAL GEOLOGY)



SACRAMENTO STATE

In Workflow

1. GEOL Committee Chair (steven.skinner@csus.edu)
2. GEOL Chair (steven.skinner@csus.edu)
3. NSM College Committee Chair (mikkel.jensen@csus.edu)
4. NSM Dean (datwyler@csus.edu)
5. Academic Services (catalog@csus.edu)
6. Senate Curriculum Subcommittee Chair (curriculum@csus.edu)
7. Faculty Senate Executive Committee Chair (kathy.honeychurch@csus.edu)
8. Faculty Senate Chair (kathy.honeychurch@csus.edu)
9. Dean of Undergraduate and Graduate (s.storms@csus.edu)
10. President (khtudor@csus.edu)
11. Catalog Editor (catalog@csus.edu)
12. Registrar's Office (k.mcfarland@csus.edu)

Approval Path

1. 2025-10-10T23:46:17Z
Steven Skinner (steven.skinner): Approved for GEOL Committee Chair
2. 2025-10-13T17:09:54Z
Steven Skinner (steven.skinner): Approved for GEOL Chair
3. 2025-10-15T23:05:59Z
Mikkel Jensen (mikkel.jensen): Rollback to Initiator
4. 2025-10-21T19:54:57Z
Steven Skinner (steven.skinner): Approved for GEOL Committee Chair
5. 2025-10-21T19:56:10Z
Steven Skinner (steven.skinner): Approved for GEOL Chair
6. 2025-10-21T20:11:11Z
Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
7. 2025-10-21T23:12:12Z
Chris Taylor (ctaylor): Approved for NSM Dean

History

1. Apr 23, 2020 by Amelia Vankeuren (vankeuren)
2. May 6, 2020 by Janett Torset (torsetj)
3. Apr 20, 2021 by 220267334
4. Aug 4, 2022 by 301127606
5. Aug 10, 2022 by 302822325

Date Submitted: 2025-10-21T19:46:26Z

Viewing: BS in Geology (Environmental Geology)

Last approved: Wed, 10 Aug 2022 23:00:29 GMT

Last edit: 2025-10-21T19:46:25Z

Changes proposed by: Amelia Vankeuren (218611017)

Academic Group: (College)

Natural Sciences & Mathematics

Academic Organization: (Department)

Geology

Catalog Year Effective:

2026-2027 Catalog

Individual(s) primarily responsible for drafting the proposed degree major program:

Name (First Last)	Email	Phone 999-999-9999
Amelia Vankeuren	vankeuren@csus.edu	916-278-7385

Type of Program:

Concentration

Program Change Type:

Substantive

Is this a pilot program?

No

Delivery Format:

Fully Face to Face

Title of the Program:

BS in Geology (Environmental Geology)

Designation: (degree terminology)

Bachelor of Science

Briefly describe the program proposal (new or change) and provide a justification:

The BS in Geology (Hydrogeology) is being slightly revised and renamed to the BS in Geology (Environmental Geology) for several reasons:

1) The broader concentration will prepare students for a larger sector of the Geology workforce. With an Environmental Geology concentration, students will be well poised for careers in water resources and/or contaminant remediation in soils and water. This will widen the pool of jobs in which program graduates will be competitive for employment.

2) The BS in Geology (Hydrogeology) needs to be revised and renamed because budget limitations prevent us from offering the class GEOL 127 Hydrogeology every year with low enrollment (fewer than 10 students). Since the course cannot be offered every year, it cannot be a required course for the concentration. However, the concentration cannot be named Hydrogeology without having Hydrogeology as a required course because employers will expect graduates to have taken it. To address this, the department would like to rename the concentration to Environmental Geology and offer the Hydrogeology course every other year as an elective class. With the class offered every other year, it will have higher enrollment because it will draw interested students from two cohorts rather than one.

3) BS in Geology graduates need additional instruction on and practice with the technical writing style used for scientific reports, such as that provided by GEOL 140 Geology and the Environment. The Geology Department consistently hears from employers that strong writing skills are a requirement for career success.

The proposed changes include:

a) Changing GEOL 127 Hydrogeology from a required class to a concentration-specific elective class. This will give students more flexibility on course options so they can tailor their classes to their career goals. It also allows the Geology department to shift from offering this class every year with relatively low enrollment (~10 students) to every other year with higher enrollment.

b) Increasing the number of concentration-specific elective units that students must take from 6 units to 10 units and the total number of elective units from 15 units to 19 units to account for the change of GEOL 127 Hydrogeology (4 units) from a required class to concentration-specific elective class.

c) Adding GEOL 140 Geology and the Environment as a required class. This class fulfills GE area 4-A Social and Behavioral Sciences and the Writing Intensive Graduation Requirement, so requiring it will not increase the number of units that students must take to graduate. Also, it is already offered every semester so requiring it will not necessitate adding any sections of the class.

University Learning Goals**Undergraduate Learning Goals:**

Competence in the disciplines

Knowledge of human cultures and the physical and natural world
 Intellectual and practical skills
 Personal and social responsibility
 Integrative learning

Program Learning Outcomes

Program Learning Outcomes

Learning Outcome

Apply fundamental geologic concepts, skills, and reasoning to solve advanced geologic problems and make geologic interpretations.

Write proficiently in scientific and technical styles to convey geologic information.

Communicate geologic concepts in presentations and discussions to professional audiences.

Evaluate the validity of scientific ideas and their implications using geologic knowledge.

Effectively locate, retrieve, read, understand, and then apply fundamental concepts to assess quality of geologic information, media, and scientific literature.

Master and apply temporal and spatial scales, units, uncertainty, rates, fractions, and trigonometry to solve geologic questions through graphs and maps.

Summarize the interactions between humans and the earth system and use this knowledge to make and justify ethical decisions.

Synthesize diverse geologic knowledge and apply this to related disciplines.

Learning Outcomes Display

Course Code	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CHEM 1A								
GEOL 10								
GEOL 10L								
GEOL 5								
GEOL 12								
GEOL 12L								
MATH 30								
PHYS 5A								
PHYS 11A								
PHYS 5B								
PHYS 11B								
GEOL 100								
GEOL 103								
GEOL 110A								
GEOL 110B								
GEOL 111A								
GEOL 111B								
GEOL 121								
CHEM 1B								
GEOL 140								
GEOL 120								

GEOL 123								
GEOL 126								
GEOL 127								
GEOL 102								
GEOL 105								
GEOL 112								
GEOL 114								
GEOL 125								
GEOL 132								
GEOL 150								
GEOL 171								
GEOL 188								
GEOL 193C								
GEOL 198A								
GEOL 198B								

Will this program be required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

Please attach a Comprehensive Program Assessment Plan

BS Geology (Environmental Geology) Assessment Plan.pdf

Please attach a Curriculum Map Matrix

BS Geology (Environmental Geology) Curriculum Map.pdf

Please attach a five-year budget projection

BS Geology (Environmental Geology) 5-year budget projection.pdf

Do these changes impact the degree roadmap?

Yes

Please attach the updated roadmap:

BS Geology Environmental Geology Concentration roadmap.pdf

Briefly describe the change:

The roadmap has been updated to:

-Remove GEOL 127 Hydrogeology as a required course

-Add an additional GEOL upper division elective course

-One of the GE Area 4-A courses was changed to the required GEOL 140 Geology and the Environment class (which fulfills 4-A and is writing intensive)

Catalog Description:

Units required for Major: 75

Total units required for BS: 120

Program Description

The BS in Geology with a concentration in Environmental Geology prepares students to enter the workforce or pursue further studies in near-surface processes such as water and soil that provide vital resources for humans and the environment. The program emphasizes the fundamentals of geology, including earth materials, stratigraphy, structural geology, and field geology. The program then builds on this foundation with coursework focusing on environmental systems and human interactions with the

Earth and environment including water resources, soil processes, land and resource management, soil and water contamination and remediation, and related natural Earth processes.

Graduates from this program will meet the educational requirements for pursuing licensure as a Professional Geologist.

As defined by policy <http://www.csus.edu/umannual/acadaff/fsm00010.htm>, a change in units constitutes a substantive change to the program. If your changes constitute a substantive change, please refer back to the "Program Change Type" field above to ensure that "Substantive" is selected.

Program Requirements: (If new courses are being created as part of a new program, it will be useful to propose courses first.)

Program Requirements

Code	Title	Units
Required Lower Division Core Courses (26 Units)		
CHEM 1A	General Chemistry I	5
GEOL 10 & 10L or GEOL 5	Physical Geology Physical Geology Lab Geology Of Mexico	4
GEOL 11	Digital Methods in Geoscience	1
GEOL 12	Historical Geology	3
GEOL 12L	Historical Geology Lab	1
MATH 30	Calculus I ¹	4
PHYS 5A or PHYS 11A	General Physics: Mechanics, Heat, Sound General Physics: Mechanics	4
PHYS 5B or PHYS 11B	General Physics: Light, Electricity and Magnetism, Modern Physics General Physics: Heat, Light, Sound, Modern Physics	4
Required Upper Division Core Courses (22 Units)		
GEOL 100	Earth Materials - Rocks and Minerals	4
GEOL 103	Sedimentology/Stratigraphy	4
GEOL 110A	Structural Geology and Tectonics	4
GEOL 110B	Structural Geology Field	1
GEOL 111A	Field Geology	2
GEOL 111B	Field Techniques	2
GEOL 121	Geology of California	3
GEOL 189	Geology Colloquium	2
Concentration (24-27 Units)		
Select from the following concentrations:		24 - 27
General Geology		
Environmental Geology		
Total Units		72-75

¹ Course also satisfies General Education (GE)/Graduation Requirement.

Concentration in Environmental Geology (27 units)

Code	Title	Units
Required Courses (8 Units)		
CHEM 1B	General Chemistry II	5
GEOL 140	Geology and the Environment 	3
Elective Courses (19 Units)		19
Select at least 10 units from the following four classes with an environmental geology focus:		19
GEOL 120	Surficial Processes	
GEOL 123	Geochemistry	
GEOL 126	Environmental Field Methods	
GEOL 127	Hydrogeology	
Remaining elective units may come from the following classes:		
GEOL 101 Optical Mineralogy		
GEOL 102	Igneous and Metamorphic Petrology	
GEOL 105	Paleontology	

GEOL 112	Geophysics For Geologists
GEOL 114	Volcanology
GEOL 125	Metallic Ore Deposits
GEOL 132	Marine Geology
GEOL 150	Computer Mapping in Geology
GEOL 171	Petroleum Geology
GEOL 188	Advanced Geologic Mapping
GEOL 193C	Engineering Geology
GEOL 198A	Senior Research Preparation
GEOL 198B	Senior Research Project

General Education Requirements ¹

Code	Title	Units
Area A: Basic Subjects (9 Units)		
A1 - Oral Communication		3
A2 - Written Communication		3
A3 - Critical Thinking		3
Area B: Physical Universe and Its Life Forms (6 Units)		
B1 - Physical Science ²		0
B2 - Life Forms		3
B3 - Lab (Note: Lab experience to be taken with one of the following: B1, B2 or B5) ²		0
B4 - Math Concepts ²		0
B5 - Additional Course (Any B to reach 12 units) - Take upper-division course to complete Area & upper division requirements.		3
Area C: Arts and Humanities (12 Units)		
C1 - Arts		3
C2 - Humanities		3
C1/C2 - Area C Course		3
C1/C2 - Area C Course - Take upper-division course to complete Area & upper division requirements.		3
Area D: The Individual and Society (9 Units)		
Area D Course		3
Area D Course		3
Area D Course - Take upper-division course to complete Area & upper division requirements.		3
Area E: Understanding Personal Development (3 Units)		
Area E Course		3
Area F: Ethnic Studies (3 Units)		
Area F Course		3
Total Units		42

¹ To help you complete your degree in a timely manner and not take more units than absolutely necessary, there are ways to use single courses to meet more than one requirement (overlap). For further information, please visit the General Education page (<https://catalog.csus.edu/colleges/academic-affairs/general-education/>).

Note: There is no way to list all possible overlaps so please consult with a professional advisor. The Academic Advising Center can be visited online (<http://www.csus.edu/acad/>), by phone (916) 278-1000, or email (advising@csus.edu).

² Required in Major; also satisfies GE.

Graduation Requirements ¹

Code	Title	Units
Graduation Requirements (required by CSU) (9 Units)		
American Institutions: U.S. History		3
American Institutions: U.S. Constitution & CA Government		3
Writing Intensive (WI)		3
Graduation Requirements (required by Sacramento State) (12 Units)		
English Composition II		3
Race and Ethnicity in American Society (RE)		3
Foreign Language Proficiency Requirement ²		6

¹ To help you complete your degree in a timely manner and not take more units than absolutely necessary, there are ways to use single courses to meet more than one requirement (overlap). For further information, please visit the General Education page (<https://catalog.csus.edu/colleges/academic-affairs/general-education/>).

Note: There is no way to list all possible overlaps so please consult with a professional advisor. The Academic Advising Center can be visited online (<http://www.csus.edu/acad/>), by phone (916) 278-1000, or email (advising@csus.edu).

² If not satisfied before entering Sacramento State, it may be satisfied in General Education Area C2 (Humanities). "C- or better required." The alternative methods for satisfying the Foreign Language Proficiency Requirement are described here: <https://www.csus.edu/college/arts-letters/world-languages-literatures/foreign-language-requirement.html>

Fiscal Impact to Change an Existing Program

Indicate programmatic or fiscal impact which this change will have on other academic units' programs, and describe the consultation that has occurred with affected units:

No fiscal impacts. Environmental Studies Department Chair Jamie Kneitel has been consulted on the proposed changes to revise the BS in Geology (Hydrogeology) to the BS in Geology (Environmental Geology). The Environmental Studies Department is supportive of this change.

Attach a copy of correspondence with these units:

GEOL Support Letter.pdf

Provide a fiscal analysis of the proposed changes:

This program change should reduce the financial strain on the Geology Department by enabling it to be more efficient in offering GEOL 127 Hydrogeology every other year as an elective instead of every year as a required course with relatively low enrollment (fewer than 10 students).

Adding GEOL 140 Geology and the Environment as a required class will not necessitate adding additional sections as the class is already offered every semester as a GE (4-A and WI).

How will the above changes be accommodated within the department/College existing fiscal resources?

This program revision will improve the Geology Department fiscal resources by allowing a course that has been previously required to be taught every year with lower enrollment be taught every other year instead.

Will the proposed changes require additional resources?

No

What additional space, equipment, operating expenses, library, computer, or media resources, clerical/technical support, or other resources will be needed?

None.

Estimate the cost and indicate how these resource needs will be accommodated:

N/A

Reviewer Comments:

Mikkel Jensen (mikkel.jensen) (Wed, 15 Oct 2025 23:05:59 GMT): Rollback: Approved pending change to "substantive program change" and attachment of necessary documents (curriculum map and assessment plan).

Key: 477