

ENVIRONMENTAL GEOSCIENCE, BACHELOR OF SCIENCE (BS) - CONCENTRATION IN GEOLOGY

The environmental geoscience (BS) concentration in geology focuses on providing students with a scientific understanding of the Earth and surrounding environment. The student in geology gains an understanding of the various terrestrial processes and features (mountains, oceans, volcanoes, glaciers); the immenseness of geologic time, the history of the earth and organisms that inhabit it (fossils); the role of water, fuel, and mineral resources in the development of civilization; and the close interaction between the geologic and organic environments.

Demand for the professional geologist comes from the needs of engineering, hydrogeologic and environmental firms; geological surveys; oil, gas and mining companies; state and national parks; museums; conservation agencies; planning commissions; and teaching institutions. A student who completes a bachelor of science in geology will have the basis for entry to graduate schools or for employment as a geologist.

Candidates completing this program are eligible to sit for the two-part Association State Boards of Geology (ASBOG) examination required for a Professional Geologist license in Pennsylvania. The first examination, Fundamentals of Geology, can be taken upon graduation. The second examination, Principles and Practices of Geology, can be taken after working for five years. Regulations for licensing vary by state and you are urged to check with the licensing board in the state you will be working.

Program Learning Outcomes

- **Outcome 1 (EGEO):** Each graduate shall develop general knowledge and understanding of the composition, history, and structure of the planet, and of the physical, chemical, and biological processes involved in the interactions between the geosphere, hydrosphere, atmosphere, and biosphere.
 - Each graduate will demonstrate an understanding of plate tectonic theory and be able to describe how it operates
 - Each graduate will demonstrate an understanding of the geologic time scale and the timing of major events in Earth history
 - Each graduate will demonstrate the ability to characterize and identify important rocks and minerals, and to interpret the processes by which they formed
 - Each graduate will demonstrate an understanding of the history, causes, and effects of global climate change
 - Each graduate will demonstrate an understanding of evolutionary theory and its evidence in the fossil record
 - Each graduate will demonstrate an understanding of the internal structure of Earth
 - Each graduate will be able to explain the fundamental principles of the hydrologic cycle

Geology, Geology, and the Environment, Overall

- **Outcome 1:** Each graduate will develop strong written and oral communication skills, demonstrate the ability to work in a collaborative environment, and exhibit professional attitudes and behavior.

- Each graduate will deliver oral presentations, demonstrating the ability to effectively communicate discipline-specific concepts
- Each graduate will write scholarly papers using acceptable format and organization with proper citations to appropriate literature.
- Each graduate will actively participate in collaborative projects and in academic field trips
- Each graduate will demonstrate professionalism and integrity in his/her academic conduct
- Each graduate shall develop the ability to respect and integrate diverse worldviews in problem-solving frameworks
- **Outcome 2:** Each graduate shall possess and apply critical thinking and problem solving skills.
 - Each graduate will demonstrate the ability to develop valid research questions and hypotheses
 - Each graduate will demonstrate the ability to apply proper techniques for data acquisition and interpretation in a problem-solving context
 - Each graduate will demonstrate the ability to solve open-ended problems using scientific methodology
 - Each graduate will develop the ability to make informed, scientifically-based decisions regarding environmental issues
- **Outcome 3:** Each graduate shall develop skills in quantitative, qualitative, technological, laboratory, and field procedures.
 - Each graduate will learn and employ accepted laboratory and field techniques, protocols, and safety procedures
 - Each graduate will learn to read, construct, and comprehend thematic maps and derive perspective output from a map
 - Each graduate will demonstrate the ability to apply knowledge, concepts and techniques from complementary disciplines to solve problems

Related Links

Environmental Geoscience - Geology, BS Program Page (<https://www.sru.edu/academics/majors-and-minors/environmental-geosciences-geology/>)

Professional Licensure/Certification Page (<https://www.sru.edu/students/student-consumer-information/professional-licensure/>)

Curriculum Guide

GPA Requirement

Major GPA: 2.0 or higher

Overall GPA: 2.0 or higher

Summary*

Code	Title	Hours
	Rock Studies 2 Requirements	45
	Other Basic Requirements	0-3
	Major/Concentration Requirements	48
	Natural Science and Math College-Wide Requirement	9
	Electives	18

* All undergraduate degree programs require a minimum of 120 credits. Some courses meet multiple requirements, but are only counted once toward the 120 credit total required to graduate.

Rock Studies 2 Requirements

Code	Title	Hours
The Rock		
SUBJ 139	Foundations of Academic Discovery ¹	3
ENGL 102	Critical Writing	3
ENGL 104	Critical Reading	3
MATH 225	Calculus I	4
Select one of the following:		3
COMM 200	Civil Discourse: Theory & Practice	
PHIL 110	Ethics and Civil Discourse	
POLS 235	Civil Discourse and Democracy	
Subtotal		16
Integrated Inquiry		
<i>Creative and Aesthetic Inquiry</i>		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
<i>Humanities Inquiry</i>		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
<i>Social Science Inquiry</i>		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
<i>Natural Sciences Inquiry</i>		
CHEM 107 & CHEM 111	General Chemistry I and General Chemistry I Lab ²	4
<i>Physical Science Inquiry</i>		
PHYS 216	University Physics 1 with Lab ²	4
Subtotal		17
Thematic Thread		
Select 12 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/) ³		12
Total Hours		45

¹ Course offered in multiple subjects; cannot take course in first major subject.

² Course counts for 50% of Major requirements and Major GPA

³ One course from each category; six credits must be 300-level or above; no more than 4 credits from one subject area; specific courses required in first major, regardless of prefix of course, cannot be used to satisfy thread requirements; any course with same prefix as first major cannot be used to satisfy thread requirements, even if it is not a course in the first major.

Basic Math Requirement

Check with your adviser or a current degree audit report to see if you have been exempted from this course. The credit earned in this course will not be counted toward the 120 credit hour minimum needed to earn a degree.

Code	Title	Hours
Complete one of the following:		0-3
Meet required minimum SAT or ACT math score OR		
ESAP 110	Beginning Algebra	
Total Hours		0-3

DIVERSITY, EQUITY, AND INCLUSION REQUIREMENT

Students must take and pass a course with the Diversity, Equity, and Inclusion (DEI) designation prior to graduation. Students can meet this requirement by taking any DEI - designated course in any program at any time during their undergraduate career.

Major/Concentration Requirements

- 29 major credits must be taken at SRU or PASSHE
- 29 major credits must be taken at the 300 level or above

Code	Title	Hours
Environmental Geoscience Core		
EGEO 131	Oceanography	3
GES 115	Introduction to Geospatial Technologies	3
GES 220	General Methods of Fieldwork	3
GES 325	Introduction to Geographic Information Science	3
<i>Capstone</i>		3
ENVS 440	Science, Technology and the Environment	
EGEO 450	Internship	
EGEO 399	Field Camp	
Subtotal		15
Geology Core Program Requirements		
EGEO 201	Earth Materials and Processes/Lab	4
EGEO 202	Earth History/Lab	4
EGEO 327	Structural Geology	4
EGEO 360	Introduction to Hydrology/Lab	3
EGEO 341	Geomorphology/Lab	3
EGEO 353		
EGEO 362	Stratigraphy/Lab	4
Subtotal		22
Electives		
Select six credits from the following:		6
EGEO 303	Paleontology/Lab	
EGEO 328	Plate Tectonics	
EGEO 342	Glacial Geology/Lab	
EGEO 358	Introduction to Geophysics/Lab	
EGEO 451	Geochemistry/Lab	
EGEO 460	Hydrogeology	
EGEO 469	Field Investigations in the Geosciences	
GES 321	Introduction to UAS for Remote Sensing and Monitoring	
GES 410	Remote Sensing	
GES 425	Advanced Geographic Information Systems	
GES 426	Environmental Modeling	
CIVL 330	Environmental Engineering *	
CIVL 340	Geotechnical Engineering *	
CIVL 350	Water Resources Engineering *	
CIVL 430	Storm Water Management *	
ENGR 230	Mechanics of Materials *	
PNGE 312	Petrophysics *	
Subtotal		6
Total Hours		43

* Some courses may require pre-requisites. Please see course descriptions to determine if there are any pre-requisites for that specific course.

Required Related Courses

Code	Title	Hours
These credits do not count towards the major		
CHEM 108	General Chemistry II	3
CHEM 112	General Chemistry II Lab	1
Total Hours		4

Natural Science & Math College-Wide Requirement

Code	Title	Hours
CHEM 107	General Chemistry I	3
CHEM 111	General Chemistry I Lab	1
MATH 225	Calculus I	4
PHYS 216	University Physics 1 with Lab	4
Total Hours		12

Co-curricular and Experiential Learning

Students are encouraged to explore additional curricular and co-curricular opportunities. There is a strong correlation between long-term student success and participation in the following types of programs and activities:

1. International study programs (short-term, semester, and year-long)
2. Student-faculty research
3. Service-learning classes
4. Internships
5. Volunteering

Important Curriculum Guide Notes

This Curriculum Guide is provided to help SRU students and prospective students better understand their intended major curriculum. Enrolled SRU students should note that the My Rock Audit may place already-earned and/or in progress courses in different, yet valid, curriculum categories. Enrolled SRU students should use the My Rock Audit Report and materials and information provided by their faculty advisers to ensure accurate progress towards degree completion. *The information on this guide is current as of the date listed. Students are responsible for curriculum requirements at the time of enrollment at the University.*

PASSHE - Pennsylvania State System of Higher Education Institutions

ENVIRONMENTAL GEOSCIENCE - BS (6124)

Concentration in Geology (GEOL)

This program is effective as of Fall 2020

Revised 12.06.2021

UCC 10.26.2021

Recommended Four-Year Plan

Course	Title	Hours
First Year		
Fall		
EGEO 131	Oceanography	3
SUBJ 139	Foundations of Academic Discovery ¹	3

ENGL 102	Critical Writing	3
ESAP 101	FIRST Seminar *	1
Creative & Aesthetic Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Humanities Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Hours		16

Spring		
ENGL 104	Critical Reading	3
EGEO 201	Earth Materials and Processes/Lab	4
Social Science Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
MATH 125	Precalculus	4
Elective		3
Hours		17

Second Year

Fall		
EGEO 202	Earth History/Lab	4
CHEM 107 & CHEM 111	General Chemistry I and General Chemistry I Lab	4
MATH 225	Calculus I	4
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Declare a Thematic Thread ²		
Hours		15

Spring		
Select one of the following:		3
COMM 200	Civil Discourse: Theory & Practice	
PHIL 110	Ethics and Civil Discourse	
POLS 235	Civil Discourse and Democracy	
CHEM 108 & CHEM 112	General Chemistry II and General Chemistry II Lab	4
MATH 230	Calculus II	4
EGEO 203	Quantitative Methods	3
EGEO 272	Introduction to Georeports/Lab	1
Hours		15

Third Year

Fall		
EGEO 360	Introduction to Hydrology/Lab	3
EGEO 362	Stratigraphy/Lab	4
PHYS 211	General Physics I with Lab	4
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Major Elective		3
Hours		17

Spring		
EGEO 303	Paleontology/Lab	4
EGEO 341	Geomorphology/Lab	3
PHYS 213	General Physics III/ Lab	4
Thematic Thread Requirement (Upper Level) (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3

Major elective		3
Hours		17
Fourth Year		
Fall		
GES 325	Introduction to Geographic Information Science	3
EGEO 351	Mineralogy/Lab	4
EGEO 327	Structural Geology	4
Major Elective		3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Hours		17
Spring		
GES 410	Remote Sensing	3
EGEO 352	Petrology/Lab	4
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Major elective		3
Field Camp (summer)		0-4
Hours		13-17
Total Hours**		127-131

¹ Course offered in multiple subjects; cannot take course in first major subject

² Work with your Academic Adviser to declare a Thematic Thread by the end of your fall semester in your second year.

* Students are encouraged to take ESAP 101 as a Free Elective.