Environmental Science BS with Environmental Geochemistry Concentration

Overview

The Department of Earth and Environmental Science provides students the opportunity to study the Earth with a variety of traditional and environmental geology course work. The faculty work closely with students to give a combination of field-based experience and current laboratory and computational techniques.

The department offers the **Bachelor of Science in Environmental Science**. Students **must select one of the following concentrations**:

- Applied Ecology
- Climate
- Environmental Geochemistry
- Hydrology

Students in the **Concentration in Environmental Geochemistry** will be equipped with the scholarly background and intellectual skills to understand a wide range of pressing environmental issues, and they will come to appreciate the physical, economic, political, demographic and ethical factors that define those issues. Our graduates find employment with government environmental agencies, citizens' organizations, consulting firms and corporate environmental affairs departments.

Anthropogenic activities have disrupted natural geochemical cycles and introduced contaminants that may affect the environment and human health. Students completing the Environmental Geochemistry concentration will understand fundamental principles that control the composition and reactions of water and materials in the environment; learn and practice methods for collection and interpretation of geochemical datasets; and integrate such datasets into broader pictures of environmental change.

Campus Location: Main

Program Code: ST-ENVS-BS

Distinction in Major

To graduate with distinction in this major, a student must satisfy the following criteria:

- achieve a minimum 3.5 major GPA
  - if the difficulty of courses chosen as electives is high, then a 3.3 GPA will suffice. This determination will be made by the appropriate faculty
- no grade below C in a major requirement

Undergraduate Contact Information

Sujith Ravi, Program Director
Beury Hall, Room 317C
215-204-7122
sravi@temple.edu

Steven Chemtob, Faculty Advisor, Environmental Science
Beury Hall, Room 325B
215-204-3958
chemtob@temple.edu

Learn more about the Bachelor of Science in Environmental Science.

These requirements are for students who matriculated in academic year 2024-2025. Students who matriculated prior to fall 2024 should refer to the Archives *to view the requirements for their Bulletin year.*

Bachelor of Science Requirements

Summary of Requirements for the Degree

1. University Requirements (123 total s.h.)
   - Students must complete all University requirements including those listed below.
   - All undergraduate students must complete at least two writing-intensive courses for a total of at least six credits at Temple as part of their major. The specific writing-intensive course options for this major are:

Code	Title	Credit Hours
EES 2096	Climate Change: Oceans To Atmosphere	4
EES 2097	Process Geomorphology	4
ENVS 4198	Environmental Science Senior Seminar	3
ECON 3596	Energy, Ecology, and Economy	3

- Students must complete the General Education (GenEd) requirements.
  - See the General Education section of the *Undergraduate Bulletin* for the GenEd curriculum.
  - Students who complete CST majors receive a waiver for 2 Science & Technology (GS) and 1 Quantitative Literacy (GQ) GenEd courses.
- Students must satisfy general Temple University residency requirements.

2. College Requirements
   - A minimum of 90 total credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), and/or the College of Engineering (ENG).
     - A minimum of 45 of these credits must be upper-level (courses numbered 2000 and above).
   - Complete a one-credit first-year or transfer seminar.
     - SCTC 1001 CST First Year Seminar for every entering first-year CST student.
     - SCTC 2001 CST Transfer Seminar for every entering transfer CST student.
3. Major Requirements for Bachelor of Science (74-78 s.h.)
   At least 10 courses required for the major must be completed at Temple.

Code	Title	Credit Hours
Chemistry		
Select one of the following:		4
CHEM 1031 & CHEM 1033	General Chemistry I and General Chemistry Laboratory I	
CHEM 1951 & CHEM 1953	Honors General Chemical Science I and Honors Chemical Science Laboratory I (F)	
Select one of the following:		4
CHEM 1032 & CHEM 1034	General Chemistry II and General Chemistry Laboratory II	
CHEM 1952 & CHEM 1954	Honors General Chemical Science II and Honors Chemical Science Laboratory II (S)	
Select one of the following:		4
CHEM 2201 & CHEM 2203	Organic Chemistry I and Organic Chemistry Laboratory I	
CHEM 2921 & CHEM 2923	Organic Chemistry for Honors I and Organic Honors Laboratory I	
Earth & Environmental Science		
EES 2001	Physical Geology	4
EES 2061	Introduction to Geochemistry	4
EES 2067	Introduction to Environmental Toxicology	3
EES 2096	Climate Change: Oceans To Atmosphere	4
Select one of the following: [1]		4
EES 3021	Groundwater Hydrology (S)	
EES 3025	Physical Hydrology (F)	
EES 3065	Nanoscience & the Environment	4
Environmental Health		
HRPR 1001	Public Health: The Way We Live, Work and Play	3
ENVH 2102	Environmental Health	3
Environmental Science		
ENVS 4198	Environmental Science Senior Seminar	3
Environmental Science Electives		
Select 5 Environmental Science Electives chosen from the categories below: [2]		
3-4 Science Electives		9-16

1-2 Policy Electives		6-3
Mathematics and Quantitative Methods		
MATH 1041	Calculus I	4
or MATH 1941	Honors Calculus I	
SCTC 1013	Elements of Data Science for the Physical and Life Sciences	3
Select one of the following:		4
MATH 1042	Calculus II	
MATH 1942	Honors Calculus II	
MATH 1044	Introduction to Probability and Statistics for the Life Sciences	
Physics		
Select one of the following:		4
PHYS 1061	Elementary Classical Physics I	
or PHYS 1961	Honors Elementary Classical Physics I	
PHYS 2021	General Physics I	
or PHYS 2921	Honors General Physics I	
Total Credit Hours		**74-78**

Code	Title	Credit Hours
(F) - Fall only course		
(S) - Spring only course		

1 The hydrology course not selected may be taken as an Environmental Science Elective (Water Elective).
2 See the table below for a listing of specific courses within each Elective category.

Code	Title	Credit Hours
Science Electives: Biology and Chemistry, Land, and Water		
Biology and Chemistry Electives - Select up to two [1]		
BIOL 2227	Principles of Ecology	3
BIOL 3114	Evolutionary Ecology (F)	3
BIOL 3244	Experimental Marine Biology	4
BIOL 3245	Marine Ecology (F)	4
BIOL 3254	Animal Behavior (S)	3
BIOL 3275	Ecology of Invasive Species (F)	3
BIOL 3307	Conservation Biology (F)	3
BIOL 3316	Tropical Marine Biology (F)	4
BIOL 3321	Plant Community Ecology (F)	3
BIOL 3323	Global Change Science: Analytics with R	3
BIOL 3336	Freshwater Ecology (F)	4
BIOL 3389	Field Research in Community Ecology	3
CHEM 3103	Analytical Chemistry	3
Land Electives - Select up to three		
EES 2002	Energy and Environment	3
EES 2021	Sedimentary Environments	4
EES 2097	Process Geomorphology	4
EES 3011	Remote Sensing and GIS	4
EES 3042	Coastal Processes and Geomorphology	4
Water Electives - Select up to one [2]		
EES 3025	Physical Hydrology (F)	4
EES 3021	Groundwater Hydrology (S)	4
Policy Electives		
CDEV 2255	Environmental Justice in Communities	3

CTRP 2251	Sustainable Food Systems Planning	3
ECON 1101	Macroeconomic Principles	3
ECON 3596	Energy, Ecology, and Economy	3
ENST 2025	Environmental Law and Regulation	3
ENST 2051	The Urban Environment	3
ENST 3015	The Geographic Basis of Land Use Planning	3
ENST 3051	Environmental Policy Issues	3
ENST 3058	Environment and Development	3
ENST 3314	Food Studies: A Geographical Perspective	3

Code	Title	Credit Hours
(F) - Fall only course		
(S) - Spring only course		

[1] All of the 3000-level Biology elective courses require BIOL 2227 as a prerequisite.
[2] One hydrology course is a required course. The course not selected may be taken as an Environmental Science Elective (Water Elective).

Suggested Academic Plan

Please note that this is a suggested academic plan. Depending on your situation, your academic plan may look different.

Bachelor of Science in Environmental Science with Concentration in Environmental Geochemistry

Suggested Plan for New Students Starting in the 2024-2025 Academic Year

Year 1		
Fall		**Credit Hours**
Select one of the following:		4
CHEM 1031 & CHEM 1033	General Chemistry I and General Chemistry Laboratory I	
CHEM 1951 & CHEM 1953	Honors General Chemical Science I and Honors Chemical Science Laboratory I (F)	
MATH 1041 or MATH 1941	Calculus I or Honors Calculus I	4
SCTC 1001	CST First Year Seminar	1
SCTC 1013	Elements of Data Science for the Physical and Life Sciences	3
GenEd Breadth Course		3
	Credit Hours	**15**
Spring		
Select one of the following:		4
CHEM 1032 & CHEM 1034	General Chemistry II and General Chemistry Laboratory II	
CHEM 1952 & CHEM 1954	Honors General Chemical Science II and Honors Chemical Science Laboratory II	
EES 2001	Physical Geology	4
Select one of the following:		4
MATH 1042 or MATH 1942	Calculus II or Honors Calculus II	
MATH 1044	Introduction to Probability and Statistics for the Life Sciences	
ENG 0802 or ENG 0812 or ENG 0902	Analytical Reading and Writing [GW] or Analytical Reading and Writing: ESL [GW] or Honors Analytical Reading and Writing [GW]	4
	Credit Hours	**16**

Year 2		
Fall		
Select one of the following:		4
CHEM 2201 & CHEM 2203	Organic Chemistry I and Organic Chemistry Laboratory I	
CHEM 2921 & CHEM 2923	Organic Chemistry for Honors I and Organic Honors Laboratory I	
EES 2061	Introduction to Geochemistry	4
IH 0851 or IH 0951	Intellectual Heritage I: The Good Life [GY] or Honors Intellectual Heritage I: The Good Life [GY]	3
GenEd Breadth Course		3-4
Elective		2-1
	Credit Hours	**16**
Spring		
EES 2096	Climate Change: Oceans To Atmosphere [WI]	4
Select one of the following:		4
PHYS 1061	Elementary Classical Physics I	
PHYS 1961	Honors Elementary Classical Physics I	
PHYS 2021	General Physics I	
PHYS 2921	Honors General Physics I	
Environmental Science Elective 1 - Science [1]		3-4
IH 0852 or IH 0952	Intellectual Heritage II: The Common Good [GZ] or Honors Intellectual Heritage II: The Common Good [GZ]	3
Elective		1-0
	Credit Hours	**15**
Year 3		
Fall		
Select one of the following: [2]		4
EES 3021	Groundwater Hydrology (S)	
EES 3025	Physical Hydrology (F)	
EES 3065	Nanoscience & the Environment (F)	4
HRPR 1001	Public Health: The Way We Live, Work and Play	3
Environmental Science Elective 2 - Science [1]		3-4
Elective		2-1
	Credit Hours	**16**
Spring		
ENVH 2102	Environmental Health	3
EES 2067	Introduction to Environmental Toxicology	3
Environmental Science Elective 3 - Policy [1]		3
GenEd Breadth Course		3
Elective		3
	Credit Hours	**15**
Year 4		
Fall		
Environmental Science Elective 4 - Science [1]		3-4
Environmental Science Elective 5 - Science or Policy [1]		3-4
GenEd Breadth Course		3
Elective		3
Elective		3-1
	Credit Hours	**15**
Spring		
ENVS 4198	Environmental Science Senior Seminar [WI]	3
GenEd Breadth Course		3

Elective		3
Elective		3
Elective		3
	Credit Hours	**15**
	Total Credit Hours	**123**

Code	**Title**	**Credit Hours**
(F) - Fall only course		
(S) - Spring only course		

[1] Select from the Environmental Science Electives lists under Requirements.

[2] Either hydrology course EES 3021 or EES 3025 can be taken. One will be offered in the Fall and one in the Spring. The course not selected may be taken as an Environmental Science Elective (Water Elective).