

# Environmental Science with Concentration in Environmental Geochemistry, B.S.

Learn more about the Bachelor of Science in Environmental Science.

Students 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 Concentration in Environmental Geochemistry will 1) understand fundamental principles that control the composition and reactions of water and materials in the environment; 2) learn and practice methods for collection and interpretation of geochemical datasets; and 3) integrate such datasets into broader pictures of environmental change.

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## Bachelor of Science

### Summary of Requirements for the Degree

#### 1. University Requirements (123 total s.h.)

- Students must complete all University requirements including those listed below.
- All Temple students must take a minimum of two writing-intensive courses 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

- 45 Upper Level (2000+) credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), or the College of Engineering (ENG).
- 90 credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), or the College of Engineering (ENG).
- All students in the College of Science and Technology are required to take a one credit first year seminar. SCTC 1001 CST First Year Seminar is the appropriate course option for every entering first year CST major. Transfer students should use SCTC 2001 CST Transfer Seminar to fulfill this requirement. Other courses that fulfill this requirement may be found on the CST College Requirements page.

#### 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
<b>Chemistry</b>		
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	
<b>Earth &amp; Environmental Science</b>		
EES 2001	Physical Geology	4
EES 2061	Introduction to Geochemistry	4
EES 2096	Climate Change: Oceans To Atmosphere	4
Select one of the following: <sup>1</sup>		4
EES 3021	Groundwater Hydrology (S)	
EES 3025	Physical Hydrology (F)	
EES 3065	Nanoscience & the Environment	4
EES 3XXX	(Toxicology)	3
<b>Environmental Health</b>		
HRPR 1001	Public Health: The Way We Live, Work and Play	3
ENVH 2102	Environmental Health	3
<b>Environmental Science</b>		
ENVS 4198	Environmental Science Senior Seminar (S)	3
<b>Environmental Science Electives</b>		
Select 5 Environmental Science Electives chosen from the categories below: <sup>2</sup>		
3-4 Science Electives		9-16
1-2 Policy Electives		6-3
<b>Mathematics and Quantitative Methods</b>		
MATH 1041 or MATH 1941	Calculus I Honors Calculus I	4
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	
<b>Physics</b>		
Select one of the following:		4
PHYS 1061 or PHYS 1961	Elementary Classical Physics I Honors Elementary Classical Physics I	
PHYS 2021 or PHYS 2921	General Physics I Honors General Physics I	
<b>Total Credit Hours</b>		<b>74-78</b>

Code	Title	Credit Hours
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(F) - Fall only course

(S) - Spring only course

<sup>1</sup> The hydrology course not selected may be taken as an Environmental Science Elective (Water Elective).

<sup>2</sup> See the table below for a listing of specific courses within each Elective category.

Code	Title	Credit Hours
<b>Science Electives: Biology and Chemistry, Land, and Water</b>		
<b>Biology and Chemistry Electives - Choose up to two <sup>1</sup></b>		
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	4
CHEM 3103	Techniques of Chemical Measurement I	3
<b>Land Electives - Choose up to three</b>		
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
<b>Water Electives - Choose up to one <sup>2</sup></b>		
EES 3025	Physical Hydrology (F)	4
EES 3021	Groundwater Hydrology (S)	4
<b>Policy Electives</b>		
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

<sup>1</sup> All of the 3000-level Biology elective courses require BIOL 2227 as a prerequisite.

<sup>2</sup> One hydrology course is a required course. The course not selected may be taken as an Environmental Science Elective (Water Elective).

## Calculation of Major GPA

Courses listed under the major requirements for the degree will be included in the calculation of the major GPA. Courses that could not apply toward the major as an elective or required course would not be counted in the calculation of the major GPA. This would include CHEM 1027, for example.

## Distinction in Major

To graduate with Distinction in Major, students are required to achieve a 3.5 GPA for courses required for the major. If the difficulty of courses chosen as electives is high, then a 3.3 GPA will earn Distinction in Major. This determination will be made by the appropriate faculty. In addition, a student graduating with distinction has no grade below C in the remaining courses required for the major.

## 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

### Requirements for New Students starting in the 2021-2022 Academic Year

Year 1		Credit Hours
<b>Fall</b>		
Select one of the following:		4
CHEM 1031 & CHEM 1033	General Chemistry I	
CHEM 1951 & CHEM 1953	Honors General Chemical Science I (F)	
MATH 1041 or 1941	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
<b>Term Credit Hours</b>		<b>15</b>
<b>Spring</b>		
Select one of the following:		4
CHEM 1032 & CHEM 1034	General Chemistry II	
CHEM 1952 & CHEM 1954	Honors General Chemical Science II	
EES 2001	Physical Geology	4
Select one of the following:		4
MATH 1042 or 1942	Calculus II	
MATH 1044	Introduction to Probability and Statistics for the Life Sciences	
ENG 0802, 0812, or 0902	Analytical Reading and Writing [GW]	4
<b>Term Credit Hours</b>		<b>16</b>
<b>Year 2</b>		
<b>Fall</b>		
Select one of the following:		4
CHEM 2201 & CHEM 2203	Organic Chemistry I	
CHEM 2921 & CHEM 2923	Organic Chemistry for Honors I	
EES 2061	Introduction to Geochemistry	4
IH 0851 or 0951	Intellectual Heritage I: The Good Life [GY]	3
GenEd Breadth Course		3-4
Elective		2-1
<b>Term Credit Hours</b>		<b>16</b>
<b>Spring</b>		
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 <sup>1</sup>		3-4
IH 0852 or 0952	Intellectual Heritage II: The Common Good [GZ]	3
Elective		1-0

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**Term Credit Hours** **15**

**Year 3**

<b>Fall</b>		
Select one of the following: <sup>2</sup>		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 <sup>1</sup>		3-4
Elective		2-1

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**Term Credit Hours** **16**

**Spring**

EES 3XXX		3
ENVH 2102	Environmental Health	3
Environmental Science Elective 3 - Policy <sup>1</sup>		3
GenEd Breadth Course		3
Elective		3

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**Term Credit Hours** **15**

**Year 4**

<b>Fall</b>		
Environmental Science Elective 4 - Science <sup>1</sup>		3-4
Environmental Science Elective 5 - Science or Policy <sup>1</sup>		3-4
GenEd Breadth Course		3
Elective		3
Elective		3-1

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**Term Credit Hours** **15**

**Spring**

ENVS 4198	Environmental Science Senior Seminar [WI] (S)	3
GenEd Breadth Course		3
Elective		3
Elective		3
Elective		3

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**Term Credit Hours** **15**

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**Total Credit Hours:** **123**

<b>Code</b>	<b>Title</b>	<b>Credit Hours</b>
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(F) - Fall only course

(S) - Spring only course

<sup>1</sup> Select from the Environmental Science Electives lists under Requirements.

<sup>2</sup> 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).