ENVIRONMENTAL SCIENCE, B.S.

Begin Campus: Any Penn State Campus

End Campus: Erie

Degree Requirements
For the Bachelor of Science degree in Environmental Science, a minimum of 121 credits is required, with at least 15 credits at the 400 level:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>45</td>
</tr>
<tr>
<td>Electives</td>
<td>0-1</td>
</tr>
<tr>
<td>Requirements for the Major</td>
<td>102-103</td>
</tr>
</tbody>
</table>

27 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses; 6 credits of GQ courses; 6 credits of GS courses; 3 credits of GH courses; 3 credits of GWS courses.

Per Senate Policy 83.80.5, the college dean or campus chancellor and program faculty may require up to 24 credits of coursework in the major to be taken at the location or in the college or program where the degree is earned.

General Education
Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required.)  
- Quantification (GQ): 6 credits
- Writing and Speaking (GWS): 9 credits

Knowledge Domains  
- Arts (GA): 6 credits
- Health and Wellness (GHW): 3 credits
- Humanities (GH): 6 credits
- Social and Behavioral Sciences (GS): 6 credits
- Natural Sciences (GN): 9 credits

Integrative Studies (may also complete a Knowledge Domain requirement)  
- Inter-Domain or Approved Linked Courses: 6 credits

University Degree Requirements
First Year Engagement
All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement  
6 credits are required and may satisfy other requirements  
- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum  
3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits  
A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work  
Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition  
The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80)). For more information, check the Suggested Academic Plan for your intended program.

Requirements for the Major  
Each student must earn at least a grade of C in each 300- and 400-level prescribed, additional, and supporting course.

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44).

Common Requirements for the Major (All Options)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 220W</td>
<td>Biology: Populations and Communities</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 111</td>
<td>Experimental Chemistry I</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 112</td>
<td>Chemical Principles II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 113</td>
<td>Experimental Chemistry II</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 202</td>
<td>Fundamentals of Organic Chemistry I</td>
<td>3</td>
</tr>
</tbody>
</table>
ENGL 202C Effective Writing: Technical Writing 3
GEOG 160 Mapping Our Changing World 3
GEOG 161 Applied Geographic Information Systems 1
MATH 141 Calculus with Analytic Geometry II 4

**Prescribed Courses: Require a grade of C or better**

BIOL 110 Biology: Basic Concepts and Biodiversity 4
BIOL 402 3
CHEM 110 Chemical Principles I 3
ENVSC 400W Case Studies in Environmental Analysis and Problem-Solving 3
MATH 140 Calculus With Analytic Geometry I 4

**Additional Courses**

Select one of the following: 3
- CIVCM 211N Foundations: Civic and Community Engagement
- PLSC 1 American Politics: Principles, Processes and Powers
- SUST 200 Foundations of Leadership in Sustainability

Select one of the following: 3-4
- SCM 200 Introduction to Statistics for Business
- STAT 200 Elementary Statistics
- STAT 250 Introduction to Biostatistics

Select one of the following: 3
- EARTH 2 The Earth System and Global Change
- GEOG 10 Physical Geography: An Introduction
- GEOSC 1 Physical Geography

Select one of the following: 3
- PHIL 103 Ethics
- PHIL 119 Ethical Leadership
- PHIL 132 Bioethics
- STS 245Z Globalization, Technology, and Ethics

Select one of the following: 3
- ECON 102 Introductory Microeconomic Analysis and Policy
- ECON 104 Introductory Macroeconomic Analysis and Policy
- GEOG 30N Environment and Society in a Changing World
- GEOG 126 Economic Geography

**Additional Courses: Require a grade of C or better**

Select one of the following sequences: 8
- PHYS 211 General Physics: Mechanics
- PHYS 212 General Physics: Electricity and Magnetism
- PHYS 250 Introductory Physics I
- PHYS 251 Introductory Physics II

**Supporting Courses and Related Areas**

Select 3 credits from the Natural & Physical Sciences program list

**Supporting Courses and Related Areas: Require a grade of C or better**

Select 3 credits of the following in consultation with adviser:

- BIOL, ENVSC, GEOG courses
- GEOSC 494M Thesis Research
- GEOSC 495 Internship
- GEOSC 496 Independent Studies

**Requirements for the Option**

Select an Option 33

1. PHYS 212 and PHYS 251 do not require a grade of C or better.
2. A maximum of 9 credits of GEOSC 494M, GEOSC 495, or GEOSC 496 may be applied toward credits for graduation in all options.

### Requirements for the Option

#### Environmental Field Science Option (33 credits)

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Prescribed Courses: Require a grade of C or better</td>
<td></td>
</tr>
<tr>
<td>BIOL 435</td>
<td>Ecology of Lakes and Streams</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 363</td>
<td>Geographic Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>GEOSC 303</td>
<td>Introduction to Environmental Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOSC 452</td>
<td>Hydrogeology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Additional Courses**

Select one of the following:

- CHEM 301 Environmental Chemistry and Analysis
- EGEE 101 Energy and the Environment
- EGEE 102 Energy Conservation for Environmental Protection
- STS 420 Energy and Modern Society

**Supporting Courses and Related Areas**

Select 12 credits from the Natural & Physical Sciences and/or the Social Sciences, Arts & Humanities program lists with not more than 6 credits from the latter list

1. A maximum of 9 credits of Thesis Research (GEOSC 494M), GEOSC 495, or GEOSC 496 may be applied toward credits for graduation in all options.
2. Students may apply 6 credits of basic ROTC.
3. CHEM 301 and STS 420 require a grade of C or better.

### Environmental Lab Science Option (33 credits)

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<tbody>
<tr>
<td></td>
<td>Prescribed Courses: Require a grade of C or better</td>
<td></td>
</tr>
<tr>
<td>CHEM 203</td>
<td>Fundamentals of Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 227</td>
<td>Analytical Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>MICRB 201</td>
<td>Introductory Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>MICRB 202</td>
<td>Introductory Microbiology Laboratory</td>
<td>2</td>
</tr>
</tbody>
</table>

**Additional Courses**

Select one of the following:

- GEOSC 412 Water Resources Geochemistry
- GEOSC 418 Soil Environmental Chemistry
- GEOSC 419 The Organic Geochemistry of Natural Waters and Sediments

Select one of the following:
### Supporting Courses and Related Areas

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOSC 451</td>
<td>Natural Resources: Origins, Economics and Environmental Impact</td>
<td></td>
</tr>
<tr>
<td>GEOSC 452</td>
<td>Hydrogeology</td>
<td></td>
</tr>
<tr>
<td>STS 420</td>
<td>Energy and Modern Society</td>
<td></td>
</tr>
</tbody>
</table>

Choose 9 credits from the Natural & Physical Sciences and/or the Social Sciences, Arts & Humanities program lists with not more than 6 credits from the latter list.  

Choose 3 credits at the 400-level from the Natural & Physical Sciences program list.

1 A maximum of 9 credits of GEOSC 494M, GEOSC 495, or GEOSC 496 may be applied toward credits for graduation in all options.

2 Students may apply 6 credits of basic ROTC.