Environmental Science, B.S.

Learning Outcomes
- Students will demonstrate their knowledge of fundamental concepts in environmental sciences in ENVR 201 and ENVR 202.
- When presented with a scientific question or hypothesis, students will be able to form an appropriate research plan and identify sources of error in resulting data or analyses.
- Students will demonstrate strong analytical writing skills.
- Students will demonstrate strong oral communication skills.

Admission, Progression and Transfer Standards
1. Any student applying for transfer to the environmental science major from other programs within the University, or from accredited colleges and universities, is required to have a minimum grade point average of 2.80 on a 4.00 scale.
2. Environmental Science majors may enroll in an environmental science course a maximum of two times to earn the required grade of C or higher. For the purposes of this standard of progression, withdrawal with a W does not constitute enrollment.

Special Opportunities
The major endorses the use of independent study courses to further students' intellectual pursuits in alternative ways. Before students may register for an independent study course, they must submit a completed independent study contract which has been approved by the major advisor and the Director of Undergraduate Studies. (No student may apply more than 6 hours of independent study credits toward the degree). A grade-point average of 2.5 or greater is required to enroll in independent study courses.

Admissions
Entrance Requirements
New freshmen who meet University admissions standards are eligible for admission to degree programs offered by the college. A student who wishes to enter the College of Arts and Sciences from another college on the Columbia campus must be in good standing and have a cumulative GPA of 2.00 or higher. A student who wishes to enter the College of Arts and Sciences from another UofSC campus must fulfill one of the following requirements:

1. Be in good standing, meet the admission requirements for a baccalaureate degree on the Columbia campus, and have a cumulative GPA of 2.00 or higher.

2. Be in good standing and have completed 30 semester hours with a GPA of 2.00 or higher on a UofSC campus.

Some programs in the College of Arts and Sciences have special admission requirements established by the department or committee that supervises the specific degree program, for example, Cardiovascular Technology, Biological Sciences, Chemistry, Biochemistry and Molecular Biology, Economics, Environmental Science, the Bachelor of Arts in Interdisciplinary Studies, and the Bachelor of Science in Interdisciplinary Studies. These requirements are listed in the sections of this bulletin that describe department and special degree programs.

Degree Requirements (128 hours)

Program of Study

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Carolina Core</td>
<td>34-46</td>
</tr>
<tr>
<td>2. College Requirements</td>
<td>15-18</td>
</tr>
<tr>
<td>3. Program Requirements</td>
<td>28-45</td>
</tr>
<tr>
<td>4. Major Requirements</td>
<td>34-46</td>
</tr>
</tbody>
</table>

Founding Documents Requirement
All undergraduate students must take a 3-credit course or its equivalent with a passing grade in the subject areas of History, Political Science, or African American Studies that covers the founding documents including the United State Constitution, the Declaration of Independence, the Emancipation Proclamation and one or more documents that are foundational to the African American Freedom struggle, and a minimum of five essays from the Federalist papers. This course may count as a requirement in any part of the program of study including the Carolina Core, the major, minor or cognate, or as a general elective. Courses that meet this requirement are listed here (https://academicbulletins.sc.edu/undergraduate/founding-document-courses/).

1. Carolina Core Requirements (34-46 hours)

CMW – Effective, Engaged, and Persuasive Communication: Written (6 hours)
must be passed with a grade of C or higher
- ENGL 101*
- ENGL 102*

ARP – Analytical Reasoning and Problem Solving (8 hours)
- MATH 141* must be passed with a grade of C or higher
- MATH 142*

SCI – Scientific Literacy (8 hours)
- BIOL 101* & BIOL 101L* or MSCI 101*
- BIOL 102* & BIOL 102L* or MSCI 102*

Note: Must take either both BIOL or both MSCI.

GFL – Global Citizenship and Multicultural Understanding: Foreign Language (0-6 hours)
Demonstration of proficiency in one foreign language equivalent to the minimal passing grade on the exit examination in the 122 course is required. Students can demonstrate this proficiency by successfully completing Phase II of the Proficiency Test or by successfully completing the 122 course, including the exit exam administered as part of that course.
- CC-GFL courses (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

It is strongly recommended that students continuing the study of a foreign language begin college-level study of that language in their first semester and
continue in that language until their particular foreign language requirement is completed.

GHS – Global Citizenship and Multicultural Understanding: Historical Thinking (3 hours)
- any CC-GHS course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

GSS – Global Citizenship and Multicultural Understanding: Social Sciences (3 hours)
- POLI 201*

AIU – Aesthetic and Interpretive Understanding (3 hours)
- any CC-AIU course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

CMS – Effective, Engaged, and Persuasive Communication: Spoken Component ¹ (0-3 hours)
- any overlay or stand-alone CC-CMS (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/course)

INF – Information Literacy ¹ (0-3 hours)
- any overlay or stand-alone CC-INF course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

VSR – Values, Ethics, and Social Responsibility ¹ (0-3 hours)
- fulfilled through POLI 201*, an overlay course with GSS, or may be filled by any overlay or stand-alone CC-VSR course

2. College Requirements (15-18 hours)

Foreign Language (0-3 hours)
- only if needed to meet 122-level proficiency

Analytical Reasoning (6 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 515</td>
<td>Statistical Methods I (or higher *)</td>
<td>3</td>
</tr>
<tr>
<td>CSCE 102</td>
<td>General Applications Programming (*)¹</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 6

¹ or a higher level CSCE course

History (3 hours)
The College of Arts and Sciences requires one additional GHS course beyond the Carolina Core GHS requirement.

- If the Carolina Core GHS requirement is fulfilled by a U.S. history course, the College of Arts and Sciences history requirement must be fulfilled by a non-U.S. history course.
- If the Carolina Core GHS requirement is fulfilled by a non-U.S. history course, the College of Arts and Sciences history requirement must be fulfilled by a U.S. history course.

Please select the College of Arts and Sciences history requirement from the approved list of U.S. and non-U.S. history courses (https://academicbulletins.sc.edu/undergraduate/arts-sciences/history-requirement/).

Social Science (3 hours)
The College of Arts and Sciences requires one 3-hour Social Science course.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 221</td>
<td>Principles of Microeconomics (*)</td>
<td>3</td>
</tr>
<tr>
<td>ECON 223</td>
<td>Introduction to Economics (*)</td>
<td></td>
</tr>
<tr>
<td>ECON 224</td>
<td>Introduction to Economics (*)</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 3

Fine Arts or Humanities (3 hours)
A Bachelor of Science from the College of Arts and Sciences requires one 3-hour Fine-Arts/Humanities course.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVR 322</td>
<td>Environmental Ethics (*)</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 312</td>
<td>Classical Origins of Western Medical Ethics (*)</td>
<td></td>
</tr>
<tr>
<td>PHIL 320</td>
<td>Ethics (*)</td>
<td></td>
</tr>
<tr>
<td>PHIL 321</td>
<td>Medical Ethics (*)</td>
<td></td>
</tr>
<tr>
<td>PHIL 322</td>
<td>Environmental Ethics (*)</td>
<td></td>
</tr>
<tr>
<td>PHIL 323</td>
<td>Ethics of Science and Technology (*)</td>
<td></td>
</tr>
<tr>
<td>PHIL 324</td>
<td>Business Ethics (*)</td>
<td></td>
</tr>
<tr>
<td>PHIL 325</td>
<td>Engineering Ethics (*)</td>
<td></td>
</tr>
<tr>
<td>PHIL 360</td>
<td>History and Philosophy of Science (*)</td>
<td></td>
</tr>
<tr>
<td>PHIL 514</td>
<td>Ethical Theory (*)</td>
<td></td>
</tr>
<tr>
<td>PHIL 550</td>
<td>Health Care Ethics (*)</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 3

3. Program Requirements (28-45 hours)

Supporting Courses (27 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 111</td>
<td>General Chemistry I &amp; 111L and General Chemistry I Lab (*)</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 112</td>
<td>General Chemistry II &amp; 112L and General Chemistry II Lab (*)</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 101</td>
<td>Introduction to the Earth (*)</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 201</td>
<td>Observing the Earth (*)</td>
<td></td>
</tr>
<tr>
<td>GEOG 201</td>
<td>Landform Geography (*)</td>
<td></td>
</tr>
<tr>
<td>PHYS 201</td>
<td>General Physics I &amp; 201L and General Physics Laboratory I (*)</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>Essentials of Physics I &amp; 211L and Essentials of Physics I Lab (*)</td>
<td>4</td>
</tr>
<tr>
<td>ENVR 548</td>
<td>Environmental Economics (*)</td>
<td></td>
</tr>
<tr>
<td>POLI 477</td>
<td>Green Politics (*)</td>
<td></td>
</tr>
<tr>
<td>ENVR 201</td>
<td>Environmental Science and Policy I (*)¹²</td>
<td>4</td>
</tr>
</tbody>
</table>

Select one of the following:

Please select the College of Arts and Sciences history requirement from the approved list of U.S. and non-U.S. history courses (https://academicbulletins.sc.edu/undergraduate/arts-sciences/history-requirement/).
Cognate or Minor (0-18 hours) **optional**

This major does not require a cognate or minor.

An optional minor may be added to a student’s program of study. A minor is intended to develop a coherent basic preparation in a second area of study. Courses applied toward general education requirements cannot be counted toward the minor. No course may satisfy both major and minor requirements. All minor courses must be passed with a grade of C or higher. At least half of the courses in the minor must be completed in residence at the University. A list of minor programs of study can be found at Programs A-Z. An optional additional major may also be added to a student’s program of study. **Additional majors must include all major courses as well as any prescribed courses noted (*) in the bulletin.**

Prescribed courses noted in the bulletin may be shared with Carolina Core, College requirements, and Program requirements in the primary program.

A list of minor programs of study can be found at Programs A-Z (https://academicbulletins.sc.edu/undergraduate/programs-az/).

**Electives (1-18 hours)**

120 (or 128) degree applicable credits are required to complete any degree at UofSC. After the cognate, minor or second major is complete, any additional credits needed to reach 120 (or 128) total credits can be fulfilled by electives. No courses of a remedial, developmental, skill-acquiring, or vocational nature may apply as credit toward degrees in the College of Arts and Sciences. The College of Arts and Sciences allows the use of the Pass-Fail option on elective courses. Further clarification on inapplicable courses can be obtained from the College of Arts and Sciences.

### 4. Major Requirements (34-36 hours)

A minimum grade of C is required in all major courses.

**Major Courses (17-18 hours)**

All majors must complete at least 34-36 hours of approved courses which must include the core requirements of 17-18 hours. Majors must complete 17-18 additional hours in major elective courses to bring them to the required 34-36 hours total. Students are required to develop a program of study in consultation with their advisor. A minimum grade of C is required for all courses used to fulfill major requirements. Any modifications to the program of study require the approval of the Director of Undergraduate Studies.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 301</td>
<td>Cell and Molecular Biology</td>
<td>3</td>
</tr>
<tr>
<td>&amp; 301L</td>
<td>Survey of the Plant Kingdom</td>
<td>3</td>
</tr>
<tr>
<td>ENVR 480</td>
<td>Environmental Issues Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

Select three of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECIV 350</td>
<td>Introduction to Environmental Engineering</td>
<td>1-4</td>
</tr>
<tr>
<td>ENHS 660</td>
<td>Concepts of Environmental Health Science</td>
<td>1-6</td>
</tr>
<tr>
<td>GEOG 202</td>
<td>Weather and Climate</td>
<td>1-6</td>
</tr>
</tbody>
</table>

---

**Major Electives (17-18 hours)**

Students, in consultation with their assigned advisor, must develop a program of study which either provides a broad set environmental science courses or allows students to focus to a defined area. Given the current course offerings and faculty expertise at the University, if a student wanted to focus their elective course work, possible areas include: Natural Systems, Climate and Weather, Water Resources, Energy, or Humans and the Environment. All Students’ elective courses should include at least 6 hours taken at the 400 level or above. All courses may be selected from ENVR designator classes, but if not ENVR classes, then no more than 3 should be from a single discipline and no more than one Research Methods course.

**Courses Acceptable for Major Credit**

- **From the Environment and Sustainability Program**
  - ENVR 321 Environmental Pollution and Health
  - ENVR 323 Global Environmental Health
  - ENVR 331 Integrating Sustainability
  - ENVR 352 Energy, Society and Sustainability
  - ENVR 399 Independent Study
  - ENVR 460 Congaree National Park: Field Investigations in Environmental Science
  - ENVR 499 Special Topics in Sustainability and the Environment
  - ENVR 499 Research in Environmental Science
  - ENVR 500 Environmental Practicum
  - ENVR 501 Special Topics in the Environment
  - ENVR 531 Sustainability Management and Leadership Strategies
  - ENVR 548 Environmental Economics
  - ENVR 571 Conservation Biology
  - ENVR 572 Freshwater Ecology
  - ENVR 998 Independent Study

- **From the Life Sciences**
  - BIOL 302 Cell and Molecular Biology
  - BIOL 420 Survey of the Plant Kingdom
  - BIOL 420L Survey of the Plant Kingdom Laboratory
  - BIOL 460 Advanced Human Physiology
  - BIOL 541 Biochemistry
  - BIOL 541L Biochemistry Laboratory
  - BIOL 549 Plant Physiology
  - BIOL 570 Principles of Ecology
  - BIOL 570L Principles of Ecology Laboratory
  - BIOL 571 Conservation Biology
  - BIOL 572 Freshwater Ecology
  - BIOL 574 Marine Conservation Biology
  - BIOL 640 Microbial Ecology
  - BIOL 671 Plant Responses to the Environment

Other BIOL courses may be selected as approved by student’s advisor.

- CHEM 321 Quantitative Analysis
- CHEM 321L Quantitative Analysis Laboratory
### Environmental Science, B.S.

#### GEOG Courses
- **GEOG 333**: Organic Chemistry I 3 credits
- **GEOG 333L**: Comprehensive Organic Chemistry Laboratory I 2 credits
- **GEOG 334**: Organic Chemistry II 3 credits
- **GEOG 334L**: Comprehensive Organic Chemistry Laboratory II 2 credits
- **GEOG 623**: Introductory Environmental Chemistry 3 credits
- **GEOG 624**: Aquatic Chemistry 3 credits

From the Earth and Marine Sciences
- **GEOL 302**: Rocks and Minerals 4 credits
- **GEOL 305**: Earth Systems through Time 4 credits
- **GEOL 315**: Surface and Sear Surface Processes 4 credits
- **GEOL 335**: Processes of Global Environmental Change 4 credits
- **GEOL 371**: A View of the River 3 credits
- **GEOL 524**: Environmental Radioisotope Geochemistry 3 credits
- **GEOL 548**: Environmental Geophysics 4 credits
- **GEOL 557**: Coastal Processes 3 credits
- **GEOL 560**: Earth Resource Management 3 credits
- **GEOL 570**: Environmental Hydrogeology 3 credits
- **GEOL 571**: Soil Hydrology 3 credits
- **GEOL 575**: Numerical Modeling for Earth Science Applications 4 credits
- **GEOL 581**: Estuarine Oceanography 3 credits

Other GEOG courses may be selected as approved by the student's advisor

From Mathematics, Statistics, and Engineering
- **CSCE 573**: Next Energy 3 credits
- **ECHE 599**: Special Advanced Topics in Chemical Engineering 3 credits
- **ECIV 362**: Introduction to Environmental Engineering 3 credits
- **ECIV 405**: System Applications in Civil Engineering 3 credits
- **ECIV 558**: Environmental Engineering Process Modeling 3 credits
- **ECIV 560**: Open Channel Hydraulics 3 credits
- **ECIV 562**: Engineering Hydrology 3 credits
- **ECIV 563**: Subsurface Hydrology 3 credits
- **ECIV 570**: Land Development for Engineers 3 credits
- **EMCH 290**: Thermodynamics 3 credits
- **EMCH 529**: Sustainable Design and Development 3 credits
- **EMCH 553**: Nuclear Fuel Cycles 3 credits
- **EMCH 592**: Introduction to Combustion 3 credits
- **EMCH 594**: Solar Heating 3 credits
- **EMCH 597**: Thermal Environmental Engineering 3 credits
- **ENCP 290**: Thermodynamic Fundamentals 3 credits
- **ENCP 540**: Environmentally Conscious Manufacturing 3 credits
- **MATH 241**: Vector Calculus 3 credits
- **MATH 242**: Elementary Differential Equations 3 credits
- **MATH 523**: Mathematical Modeling of Population Biology 3 credits
- **STAT 516**: Statistical Methods II 3 credits
- **STAT 518**: Nonparametric Statistical Methods 3 credits
- **STAT 520**: Forecasting and Time Series 3 credits
- **STAT 528**: Environmental Statistics 3 credits
- **STAT 540**: Computing in Statistics 3 credits

Other GEOL courses may be selected as approved by the student's advisor.
## From the Health Sciences

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENHS 321</td>
<td>Environmental Pollution and Health</td>
<td>3</td>
</tr>
<tr>
<td>ENHS 660</td>
<td>Concepts of Environmental Health Science</td>
<td>3</td>
</tr>
<tr>
<td>ENHS 665</td>
<td>Biofilms in Environmental Health and Disease</td>
<td>3</td>
</tr>
<tr>
<td>ENHS 670</td>
<td>Environmental Pollutants and Human Health</td>
<td>3</td>
</tr>
</tbody>
</table>

## Research Methods Courses

Not required, but if selected, only one of these three may be taken for credit towards the major.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCE 145</td>
<td>Algorithmic Design I</td>
<td>4</td>
</tr>
<tr>
<td>ECIV 111</td>
<td>Introduction to Engineering Graphics and Visualization</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 111</td>
<td>Introduction to Computer-Aided Design</td>
<td>3</td>
</tr>
</tbody>
</table>

## Major Map

A major map is a layout of required courses in a given program of study, including critical courses and suggested course sequences to ensure a clear path to graduation.

Major maps are only a suggested or recommended sequence of courses required in a program of study. Please contact your academic advisor for assistance in the application of specific coursework to a program of study and course selection and planning for upcoming semesters.