## ENVIRONMENTAL SCIENCE, B.S.

Degree Requirements (128 hours)
Program of Study

| Requirements | Credit Hours |
| :--- | :--- |
| 1. Carolina Core | $34-46$ |
| 2. College Requirements | $15-18$ |
| 3. Program Requirements | $28-45$ |
| 4. Major Requirements | $34-46$ |

## 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) <br> CMW - Effective, Engaged, and Persuasive Communication: Written (6 hours) <br> 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.

[^0]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) <br> - 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-corecourses/)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) <br> Foreign Language ( $0-3$ hours)

- only if needed to meet 122 -level proficiency


## Analytical Reasoning (6 hours)

| Course | Title | Credits |
| :---: | :---: | :---: |
| STAT 515 | Statistical Methods I (or higher *) | 3 |
| Select one of the following: |  | 3 |
| CSCE 102 | General Applications Programmin |  |
| or a higher level CSCE course |  |  |
| MSCI 305 | Ocean Data Analysis |  |
| MSCI 509 | MATLAB-Based Data Analysis in Oce |  |
| Total Credit Hours 6 |  |  |

Note: Courses used to fulfill the College requirements may not also be used to fulfill other degree requirements.

## 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/historyrequirement/).

## Social Science (3 hours)

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

| Course | Title | Credits |
| :--- | :--- | ---: |
| Select one of the following: | 3 |  |
| ECON 221 | Principles of Microeconomics ( ${ }^{*}$ ) |  |
| ECON 223 | Introduction to Economics ( ${ }^{*}$ ) |  |
| ECON 224 | Introduction to Economics ( $)$ |  |

## 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.

| Course | Title | Credits |
| :---: | :---: | :---: |
| Select one of the following: |  | 3 |
| ENVR 322 | Environmental Ethics (*) |  |
| PHIL 312 | Classical Origins of Western Medical Ethics (*) |  |
| PHIL 320 | Ethics (*) |  |
| PHIL 321 | Medical Ethics (*) |  |
| PHIL 322 | Environmental Ethics (*) |  |
| PHIL 323 | Ethics of Science and Technology (*) |  |
| PHIL 324 | Business Ethics (*) |  |
| PHIL 325 | Engineering Ethics (*) |  |
| PHIL 360 | History and Philosophy of Science (*) |  |
| PHIL 514 | Ethical Theory (*) |  |
| PHIL 550 | Health Care Ethics (*) |  |

Total Credit Hours

## 3. Program Requirements (28-45 hours) Supporting Courses (27 hours)

| Course | Title | Credits |
| :--- | :--- | ---: |
| Select one of the following: | 8 |  |
| CHEM 111 | General Chemistry I <br> \& 111L | and General Chemistry I Lab (*) |
| and |  |  |
| CHEM 112 | General Chemistry II <br> \& 112L | and General Chemistry II Lab (*) |
| or |  |  |
| CHEM 141 | Principles of Chemistry I |  |
| \& 142 | and Principles of Chemistry II (*) |  |


| Select one of the following: | 4 |
| :--- | :--- | ---: |
| PHYS 201 | General Physics I |
| \& 201L | and General Physics Laboratory I (*) |

## 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 USC. 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, skillacquiring, 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.

| Course | Title | Credits |
| :--- | :--- | ---: |
| BIOL 301 | Ecology and Evolution | 4 |
| \& 301L | and Ecology and Evolution Laboratory |  |
| ENVR 480 | Capstone Seminar in Environmental Science and <br>  <br>  <br> Environmental Studies | 3 |
| Select three of the following: | 10-11 |  |
| ECIV 350 | Introduction to Environmental Engineering |  |
| ENHS 660 | Concepts of Environmental Health Science |  |
| GEOG 202 | Weather and Climate |  |
| GEOL 315 | Surface and Near Surface Processes |  |

Total Credit Hours 17-18

## 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 in 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' selective 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

| Course | Title | Credits |
| :--- | :--- | ---: |
| From the Environment and Sustainability Program |  |  |
| ENVR 231 | Introduction to Sustainability Management and  <br>  Leadership | $3-4$ |
| ENVR 321 | Environmental Pollution and Health | 3 |
| ENVR 323 | Global Environmental Health | 3 |
| ENVR 331 | Integrating Sustainability | 3 |
| ENVR 348 | Environmental Racism and Justice | 3 |
| ENVR 352 | Energy, Society and Sustainability | 3 |
| ENVR 399 | Independent Study | $1-6$ |
| ENVR 460 | Congaree National Park: Field Investigations in | 4 |
|  | Environmental Science | $1-4$ |
| ENVR 490 | Special Topics in Sustainability and the | $1-3$ |
|  | Environment | 3 |
| ENVR 499 | Research in Environmental Science | 3 |
| ENVR 500 | Environmental Practicum | $3-4$ |
| ENVR 501 | Special Topics in the Environment |  |
| ENVR 531 | Sustainability Management and Leadership | 3 |
|  | Strategies | 3 |
| ENVR 533 | Sustainability Projects Course | 3 |
| ENVR 548 | Environmental Economics | 3 |
| ENVR 571 | Conservation Biology | 3 |
| ENVR 572 | Freshwater Ecology | 3 |


| From the Life Sciences |  |  |
| :--- | :--- | :--- |
| BIOL 302 | Cell and Molecular Biology | 3 |
| BIOL 302L | Cell and Molecular Biology Laboratory | 1 |
| BIOL 303 | Fundamental Genetics | 3 |


| BIOL 420 | Survey of the Plant Kingdom | 3 |
| :--- | :--- | :--- |
| BIOL 420L | Survey of the Plant Kingdom Laboratory | 1 |
| BIOL 460 | Advanced Human Physiology | 3 |
| BIOL 541 | Biochemistry | 3 |
| BIOL 541L | Biochemistry Laboratory | 1 |
| BIOL 549 | Plant Physiology | 4 |
| BIOL 570 | Principles of Ecology | 3 |
| BIOL 570L | Principles of Ecology Laboratory | 1 |
| BIOL 571 | Conservation Biology | 3 |
| BIOL 572 | Freshwater Ecology | 3 |
| BIOL 574 | Marine Conservation Biology | 3 |
| BIOL 640 | Microbial Ecology | 3 |
| BIOL 654 | Speciation | 3 |
| BIOL 671 | Plant Responses to the Environment | 3 |

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

| CHEM 321 | Quantitative Analysis | 3 |
| :--- | :--- | :--- |
| CHEM 321L | Quantitative Analysis Laboratory | 1 |
| CHEM 331L | Essentials of Organic Chemistry Laboratory I | 1 |
| CHEM 332L | Essentials of Organic Chemistry Laboratory II | 1 |
| CHEM 333 | Organic Chemistry I | 3 |
| CHEM 333L | Comprehensive Organic Chemistry Laboratory I | 2 |
| CHEM 334 | Organic Chemistry II | 3 |
| CHEM 334L | Comprehensive Organic Chemistry Laboratory II | 2 |
| CHEM 623 | Introductory Environmental Chemistry | 3 |
| CHEM 624 | Aquatic Chemistry | 3 |

From the Earth and Marine Sciences
GEOL $302 \quad$ Rocks and Minerals
GEOL $305 \quad$ Earth Systems through Time 4
GEOL 315 Surface and Near Surface Processes 4
GEOL 335 Processes of Global Environmental Change 4
GEOL 371 A View of the River 3
GEOG 516 Coastal Zone Management 3
GEOL 524 Environmental Radioisotope Geochemistry 3
GEOL 548 Environmental Geophysics 4
GEOL 557 Coastal Processes 3
GEOL 560 Earth Resource Management 3
GEOL 570 Environmental Hydrogeology 3
GEOL 571 Soil Hydrology 4
GEOL 575 Numerical Modeling for Earth Science Applications 3
GEOL 581 Estuarine Oceanography 3

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

| MSCI 305 | Ocean Data Analysis | 3 |
| :--- | :--- | :--- |
| MSCI 311 | Biology of Marine Organisms | 4 |
| MSCI 313 | The Chemistry of the Sea | 4 |
| MSCI 450 | Principles of Biological Oceanography | 3 |
| MSCI 521 | Introduction to Geochemistry | 3 |
| MSCI 537 | Aquaculture | 3 |
| MSCI 552 | Population Genetics | 3 |
| MSCI 566 | Ecosystem Analysis | 3 |
| MSCI 575 | Marine Ecology | 3 |


| MSCI 579 | Air-Sea Interaction | 3 |
| :---: | :---: | :---: |
| MSCI 582 | Marine Hydrodynamics | 3 |
| From Geography |  |  |
| GEOG 202 | Weather and Climate | 4 |
| GEOG 343 | Environment and Society | 3 |
| GEOG 346 | Climate and Society | 3 |
| GEOG 347 | Water as a Resource | 3 |
| GEOG 348 | Biogeography | 3 |
| GEOG 349 | Cartographic Animation | 3 |
| GEOG 360 | Geography of Wind | 3 |
| GEOG 263 | Geographic Information Systems | 3 |
| GEOG 365 | Hurricanes and Tropical Climatology | 3 |
| GEOG 371 | Air Pollution Fundamentals | 3 |
| GEOG 530 | Environmental Hazards | 3 |
| GEOG 545 | Weather Analysis and Forecasting | 4 |
| GEOG 546 | Applied Climatology | 4 |
| GEOG 547 | Fluvial Geomorphology | 3 |
| GEOG 549 | Water and Watersheds | 3 |
| GEOG 551 | Remote Sensing of the Environment | 3 |
| GEOG 554 | Spatial Programming | 3 |
| GEOG 562 | Satellite Mapping and the Global Positioning System | 3 |
| GEOG 563 | Advanced Geographic Information Systems | 3 |
| GEOG 564 | GIS-Based Modeling | 3 |
| GEOG 567 | Long-Term Environmental Change | 3 |
| GEOG 568 | Human Dimensions of Global Environmental Change | 3 |
| GEOG 569 | International Development and the Environment | 3 |
| GEOG 570 | Geography of Public Land and Water Policy | 3 |
| GEOG 571 | Microclimatology | 4 |
| GEOG 573 | Climatic Change and Variability | 3 |
| Other GEOG courses may be selected as approved by the student's advisor |  |  |
| From Mathematics, Statistics, and Engineering |  |  |
| CSCE 106 | Scientific Applications Programming | 3 |
| CSCE 567 | Visualization Tools | 3 |
| ECHE 300 | Chemical Process Principles | 3 |
| ECHE 310 | Introductory Chemical Engineering Thermodynamics | 3 |
| ECHE 311 | Chemical Engineering Thermodynamics | 3 |
| ECHE 567 | Process Safety, Health and Loss Prevention | 3 |
| ECHE 573 | Next Energy | 3 |
| ECHE 589 | Special Advanced Topics in Chemical Engineering | 3 |
| ECIV 350 | Introduction to Environmental Engineering | 3 |
| ECIV 350L | Introduction to Environmental Engineering Laboratory | 1 |
| ECIV 362 | Introduction to Water Resources Engineering | 3 |
| ECIV 405 | System Applications in Civil Engineering | 3 |
| ECIV 551 | Elements of Water and Wastewater Treatment | 3 |
| ECIV 555 | Principles of Municipal Solid Waste Engineering | 3 |
| ECIV 556 | Air Pollution Control Engineering | 3 |
| ECIV 557 | Sustainable Construction for Engineers | 3 |
| ECIV 558 | Environmental Engineering Process Modeling | 3 |


| ECIV 560 | Open Channel Hydraulics | 3 |
| :---: | :---: | :---: |
| ECIV 562 | Engineering Hydrology | 3 |
| ECIV 563 | Subsurface Hydrology | 3 |
| ECIV 570 | Land Development for Engineers | 3 |
| EMCH 290 | Thermodynamics | 3 |
| EMCH 529 | Sustainable Design and Development | 3 |
| EMCH 553 | Nuclear Fuel Cycles | 3 |
| EMCH 592 | Introduction to Combustion | 3 |
| EMCH 594 | Solar Heating | 3 |
| EMCH 597 | Thermal Environmental Engineering | 3 |
| ENCP 290 | Thermodynamic Fundamentals | 3 |
| ENCP 540 | Environmentally Conscious Manufacturing | 3 |
| MATH 241 | Vector Calculus | 3 |
| MATH 242 | Elementary Differential Equations | 3 |
| MATH 523 | Mathematical Modeling of Population Biology | 3 |
| STAT 516 | Statistical Methods II | 3 |
| STAT 518 | Nonparametric Statistical Methods | 3 |
| STAT 520 | Forecasting and Time Series | 3 |
| STAT 528 | Environmental Statistics | 3 |
| STAT 540 | Computing in Statistics | 3 |
| From the Health Sciences |  |  |
| ENHS 321 | Environmental Pollution and Health | 3 |
| ENHS 660 | Concepts of Environmental Health Science | 3 |
| ENHS 665 | Biofilms in Environmental Health and Disease | 3 |
| ENHS 670 | Environmental Pollutants and Human Health | 3 |

## Research Methods Courses

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

| Course | Title | Credits |
| :--- | :--- | ---: |
| CSCE 145 | Algorithmic Design I | 4 |
| ECIV 111 | Introduction to Engineering Graphics and | 3 |
|  | Visualization |  |
| EMCH 111 | Introduction to Computer-Aided Design | 3 |


[^0]:    - CC-GFL courses (https://academicbulletins.sc.edu/undergraduate/ carolina-core-courses/)

