

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)

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)

Course	Title	Credits
STAT 515	Statistical Methods I (or higher *)	3
Select one of the following:		3
CSC 102	General Applications Programming (*)	
or a higher level CSC course		
MSCI 305	Ocean Data Analysis	
MSCI 509	MATLAB-Based Data Analysis in Ocean Sciences	
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/history-requirement/>).

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

3. Program Requirements (28-45 hours)

Supporting Courses (27 hours)

Course	Title	Credits
Select one of the following: 8		
CHEM 111 & 111L	General Chemistry I and General Chemistry I Lab (*)	
and		
CHEM 112 & 112L	General Chemistry II and General Chemistry II Lab (*)	
or		
CHEM 141 & 142	Principles of Chemistry I and Principles of Chemistry II (*)	
Select one of the following: 4		
GEOL 101	Introduction to the Earth (*)	
GEOL 201	Observing the Earth (*)	
GEOG 201	Landform Geography (*)	

Select one of the following: 4

PHYS 201 & 201L	General Physics I and General Physics Laboratory I (*)	
PHYS 211 & 211L	Essentials of Physics I and Essentials of Physics I Lab (*)	
Select one of the following: 3		
ENVR 548	Environmental Economics (*)	
POLI 477	Green Politics (*)	
POLI 478	Environmental Policy (*)	
ENVR 201	Environmental Science and Policy I (*) ^{1,2}	4
ENVR 202	Environmental Science and Policy II (*) ^{1,2}	4
Total Credit Hours		27

¹ Pre-major course that must be completed before taking major courses.

² Must be passed with a grade of C or higher.

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, 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.

Course	Title	Credits
BIOL 301 & 301L	Ecology and Evolution and Ecology and Evolution Laboratory	4
ENVR 480	Capstone Seminar in Environmental Science and 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 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 Environmental Science	4
ENVR 490	Special Topics in Sustainability and the Environment	1-4
ENVR 499	Research in Environmental Science	1-3
ENVR 500	Environmental Practicum	3
ENVR 501	Special Topics in the Environment	3
ENVR 531	Sustainability Management and Leadership Strategies	3-4
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	Rocks and Minerals	4
GEOL 305	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	ECIV 560	Open Channel Hydraulics	3
MSCI 582	Marine Hydrodynamics	3	ECIV 562	Engineering Hydrology	3
From Geography			ECIV 563	Subsurface Hydrology	3
GEOG 202	Weather and Climate	4	ECIV 570	Land Development for Engineers	3
GEOG 343	Environment and Society	3	EMCH 290	Thermodynamics	3
GEOG 346	Climate and Society	3	EMCH 529	Sustainable Design and Development	3
GEOG 347	Water as a Resource	3	EMCH 553	Nuclear Fuel Cycles	3
GEOG 348	Biogeography	3	EMCH 592	Introduction to Combustion	3
GEOG 349	Cartographic Animation	3	EMCH 594	Solar Heating	3
GEOG 360	Geography of Wind	3	EMCH 597	Thermal Environmental Engineering	3
GEOG 263	Geographic Information Systems	3	ENCP 290	Thermodynamic Fundamentals	3
GEOG 365	Hurricanes and Tropical Climatology	3	ENCP 540	Environmentally Conscious Manufacturing	3
GEOG 371	Air Pollution Fundamentals	3	MATH 241	Vector Calculus	3
GEOG 530	Environmental Hazards	3	MATH 242	Elementary Differential Equations	3
GEOG 545	Weather Analysis and Forecasting	4	MATH 523	Mathematical Modeling of Population Biology	3
GEOG 546	Applied Climatology	4	STAT 516	Statistical Methods II	3
GEOG 547	Fluvial Geomorphology	3	STAT 518	Nonparametric Statistical Methods	3
GEOG 549	Water and Watersheds	3	STAT 520	Forecasting and Time Series	3
GEOG 551	Remote Sensing of the Environment	3	STAT 528	Environmental Statistics	3
GEOG 554	Spatial Programming	3	STAT 540	Computing in Statistics	3
GEOG 562	Satellite Mapping and the Global Positioning System	3	From the Health Sciences		
GEOG 563	Advanced Geographic Information Systems	3	ENHS 321	Environmental Pollution and Health	3
GEOG 564	GIS-Based Modeling	3	ENHS 660	Concepts of Environmental Health Science	3
GEOG 567	Long-Term Environmental Change	3	ENHS 665	Biofilms in Environmental Health and Disease	3
GEOG 568	Human Dimensions of Global Environmental Change	3	ENHS 670	Environmental Pollutants and Human Health	3
GEOG 569	International Development and the Environment	3	Research Methods Courses		
GEOG 570	Geography of Public Land and Water Policy	3	Not required, but if selected, only one of these three may be taken for credit towards the major.		
GEOG 571	Microclimatology	4	Course	Title	Credits
GEOG 573	Climatic Change and Variability	3	CSCE 145	Algorithmic Design I	4
Other GEOG courses may be selected as approved by the student's advisor			ECIV 111	Introduction to Engineering Graphics and Visualization	3
From Mathematics, Statistics, and Engineering			EMCH 111	Introduction to Computer-Aided Design	3
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			