

# Environmental Sciences (BS)

This area of study uses interdisciplinary approaches that link natural science and social science disciplines, and a knowledge of environmental systems and earth processes. Such interdisciplinary approaches are essential for understanding changes in a rapidly changing world, and for understanding our past, present, and future. Environmental scientists will help ensure human prospects by improving both socio-economic development and environmental quality through innovation in new technologies and policies.

Public interest about environmental issues is increasing. Protecting and improving the environment involves knowledge and systematic problem-solving skills that are essential for environmental sciences. North Carolina State University's environmental sciences degree program provides sound, individualized academic programs for students who can develop a wide range of careers. For information on entrance requirements, contact the program coordinator:

## Erin Champion

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## Plan Requirements

Code	Title	Hours
<b>English &amp; Communication</b>		
ENG 101	Academic Writing and Research <sup>1</sup>	4
	Communication Skills (p. 1)	6
<b>Mathematics and Science</b>		
MA 131 or MA 141	Calculus for Life and Management Sciences A Calculus I	3
MA 231 or MA 241	Calculus for Life and Management Sciences B Calculus II	3
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
	Select one of the following:	4
CH 220 & CH 222	Introductory Organic Chemistry and Organic Chemistry I Lab	
CH 221 & CH 222	Organic Chemistry I and Organic Chemistry I Lab	
	Select one of the following:	4
PY 131	Conceptual Physics	
PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory	
PY 211	College Physics I	
	Science Electives (p. 2)	4
<b>Natural Sciences</b>		
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
AEC/PB 360	Ecology	4

or BIO 183	Introductory Biology: Cellular and Molecular Biology	
	Natural Sciences Electives (p. 2)	4
<b>Departmental Requirements</b>		
ENV 100	Student Success in Environmental First Year	1
ENV 101	Exploring the Environment	2
ES 100	Introduction to Environmental Sciences <sup>1</sup>	3
ES 111	Applications of Environmental Sciences <sup>1</sup>	1
ES 200	Climate Change and Sustainability <sup>1</sup>	3
ES 300	Energy and Environment <sup>1</sup>	3
ES 400	Analysis of Environmental Issues <sup>1</sup>	3
ST 311	Introduction to Statistics	3
	Analytical Skills Electives (p. 2)	3
	Economics Electives (p. 2)	3
	Environmental Law and Policy Electives (p. )	3
	External Learning Experience (p. 3)	3
<b>Focal Area</b>		
	ES Focal Area (See Advisor) <sup>2</sup>	15
<b>Electives</b>		
	Advised Electives (See Advisor) <sup>2</sup>	9
<b>General Education Program (GEP) Courses</b>		
	GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )	6
	GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )	2
	GEP Elective ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> )	3
	GEP Global Knowledge ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/</a> ) (Verify Requirements)	
	GEP Foundations of American Democracy ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-fad/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-fad/</a> ) (verify requirement)	
	World Language Proficiency ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/</a> ) GEP Global Knowledge ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/</a> ) (Verify Requirements)	
<b>Free Electives</b>		
	Free Electives (12 Hr S/U Lmt) <sup>3</sup>	10
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> A grade of C- or better is required.

<sup>2</sup> Students should consult their academic advisors to determine how to complete this requirement.

<sup>3</sup> Students should consult their academic advisors to determine which courses fill this requirement.

## Communication Skills Electives

Code	Title	Hours
<b>Written Communication Skills</b>		
	Maximum of 3 credits	
COM 336	Newsletter Writing and Production	3
ENG 210	Introduction to Language and Linguistics	3
ENG 214	Introduction to Editing	3
ENG 216	Technologies for Texts	3

ENG 281	Introduction to Creative Nonfiction	3
ENG 287	Explorations in Creative Writing	3
ENG 288	Fiction Writing	3
ENG 289	Poetry Writing	3
ENG 292	Writing About Film	3
ENG 316	Introduction to News and Article Writing	3
ENG 317	Designing Networked Communications	3
ENG 323	Writing in Rhetorical Traditions	3
ENG 324	Modern English Syntax	3
ENG 331	Communication for Engineering and Technology	3
ENG 332	Communication for Business and Management	3
ENG 333	Communication for Science and Research	3
ENG 422	Writing Theory and the Writing Process	3
ENG 425	Analysis of Scientific and Technical Writing	3
ENG 426	Analyzing Style	3
FLE 402	Advanced Written Communication in English for International Students	3

**Verbal/Oral Communication Skills**

Maximum of 3 credits

AEE 311	Communication Methods and Media	3
COM 110	Public Speaking	3
COM 112	Interpersonal Communication	3
COM 202	Small Group Communication	3
COM 211	Argumentation and Advocacy	3
COM 226	Introduction to Public Relations	3
COM 289	Science Communication and Public Engagement	3
COM 292	Language, Communication, and Culture	3
COM 392	International and Crosscultural Communication	3
COM 395	Studies in Rhetoric and Digital Media	3
COM 411	Rhetorical Criticism	3
COM 436	Environmental Communication	3
COM 479	Climate Change Communication	3
ENG 321	Survey of Rhetorical Theory	3
ENG 325	Spoken and Written Traditions of American English Dialects	3
ENG 326	History of the English Language	3
ENG 327	Language and Gender	3
ENG 328	Linguistics for Education Professionals	3
ENG 329	Language in Globalization	3
ENG 335	Language Development	3
ENG 395	Studies in Rhetoric and Digital Media	3
ENG 411	Rhetorical Criticism	3
ENG 494	Special Topics in Linguistics	1-3
HSS 392	International and Crosscultural Communication	3
PRT 342	Recreation and Park Interpretive Services	3
THE 103	Introduction to the Theatre	3
THE 203	Theory and Practice of Acting	3
THE 293	Theater Practicum	1-6
WGS 327	Language and Gender	3

**Science Electives**

Code	Title	Hours
CH 201	Chemistry - A Quantitative Science	4

& CH 202	and Quantitative Chemistry Laboratory	
GN 311	Principles of Genetics	4
MB 351	General Microbiology	4
& MB 352	and General Microbiology Laboratory	
PY 208	Physics for Engineers and Scientists II	4
& PY 209	and Physics for Engineers and Scientists II Laboratory	
PY 212	College Physics II	4

**Natural Sciences Electives**

Code	Title	Hours
AEC 419	Freshwater Ecology	4
AEC 460	Field Ecology and Methods	4
FOR 260	Forest Ecology	4
FOR 401	Dendrology	4
MEA 200	Introduction to Oceanography	4
& MEA 210	and Oceanography Lab	
PB 250	Plant Biology	4
PB 345	Economic Botany	4
& PB 346	and Economic Botany Lab	
SSC 200	Soil Science	4
& SSC 201	and Soil Science Laboratory	
ZO 250	Animal Anatomy and Physiology	4
ZO 350	Animal Phylogeny and Diversity	4
ZO 402	Invertebrate Biology	4

**Analytical Skills Electives**

Code	Title	Hours
GIS 280	Introduction to GIS	3
ST 312	Introduction to Statistics II	3
FOR 353	GIS and Remote Sensing for Environmental Analysis and Assessment	3
PS 371	Research Methodology of Political Science	3

**Economics Electives**

Code	Title	Hours
ARE 201	Introduction to Agricultural & Resource Economics	3
ARE 201A	Introduction to Agricultural & Resource Economics	3
EC 201	Principles of Microeconomics	3
EC 205	Fundamentals of Economics	3
NR 219	Natural Resource Markets	3

**Environmental Law and Policy Electives**

Code	Title	Hours
ARE 309	Environmental Law & Economic Policy	3
PS 320	U.S. Environmental Law and Politics	3
PS 336	Global Environmental Politics	3
NR 460	Renewable Natural Resource Management and Policy	3

## External Learning Experience Electives

Code	Title	Hours
ES 496	Environmental Science Internship	1-3
ES 497	Professional Development in Environmental Science	1-3
ES 498	Research in Environmental Science	1-3
ES 499	Thesis in Environmental Science	3

## Semester Sequence

This is a sample.

### First Year

Fall Semester		Hours
ENV 100	Student Success in Environmental First Year	1
ENV 101	Exploring the Environment	2
ENG 101	Academic Writing and Research	4
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
MA 131	Calculus for Life and Management Sciences A	3
GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )		1
<b>Hours</b>		<b>15</b>

### Spring Semester

ES 100	Introduction to Environmental Sciences <sup>1</sup>	3
ES 111	Applications of Environmental Sciences <sup>1</sup>	1
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
MA 231	Calculus for Life and Management Sciences B	3
GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )		3
<b>Hours</b>		<b>14</b>

### Second Year

Fall Semester		
CH 220 & CH 222	Introductory Organic Chemistry and Organic Chemistry I Lab	4
AEC/PB 360 or BIO 183	Ecology or Introductory Biology: Cellular and Molecular Biology	4
Communications Requirement (p. )		3
Free Elective		3
GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )		1
<b>Hours</b>		<b>15</b>

### Spring Semester

ES 200	Climate Change and Sustainability <sup>1</sup>	3
Natural Sciences Electives (p. 2)		4
Economics Requirement (p. 2)		3
Advised Elective I <sup>3</sup>		3

GEP Elective ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> )	3
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**Hours 16**

### Third Year

#### Fall Semester

PY 205 & PY 206 or PY 131 or PY 211	Physics for Engineers and Scientists I or Conceptual Physics or College Physics I	4
ST 311	Introduction to Statistics	3
Environmental Law and Policy Electives (p. )		3
Focal Area I <sup>2</sup>		3
Free Elective		3

**Hours 16**

#### Spring Semester

ES 300	Energy and Environment <sup>1</sup>	3
Sciences Electives (p. 2)		4
Analytical Skills Electives (p. 2)		3
Focal Area II <sup>2</sup>		3
Communications Requirement (p. )		3

**Hours 16**

### Fourth Year

#### Fall Semester

Focal Area III <sup>2</sup>		3
Free Elective		3
Advised Elective II <sup>3</sup>		3
Focal Area IV <sup>2</sup>		3
External Learning Experience (p. 3)		3

**Hours 15**

#### Spring Semester

ES 400	Analysis of Environmental Issues <sup>1</sup>	3
Focal Area V <sup>2</sup>		3
400-level Advised Elective <sup>3</sup>		3
GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )		3
Free Elective <sup>2</sup>		1

**Hours 13**

**Total Hours 120**

<sup>1</sup> Must be completed with a grade of C- or higher.

<sup>2</sup> See adviser to determine a relevant focal area and related course selections.

<sup>3</sup> Advised Electives (9 credit hours) are to be selected in consultation with your adviser and need to focus on Environmental Science. At least 6 hours must be at the 400-level or above.

## Career Opportunities

The Environmental Sciences program provides opportunities for students to rigorously explore complex, interdisciplinary environmental issues by combining courses from a number of NC State colleges to create a thorough interdisciplinary grounding. All degree options encourage students to pursue original research and gain field experience tackling real-world challenges — leaving them well prepared to take advantage of career opportunities once they graduate. Some graduates find jobs in the

environmental industry, including careers as environmental consultants, working in large corporations, or starting their own businesses. Others find careers working in federal, state, and local agencies with environmental mandates. Still others continue their educations in professional and graduate schools.

## Career Titles

- Agricultural Technician
- Atmospheric and Space Scientist
- Biochemist
- Biologist
- Biomedical Engineer
- Chemist
- Chief Sustainability Officers
- Climate Change Policy Analysts
- Conservation Scientist
- Environmental Compliance Inspector
- Environmental Disease Analyst
- Environmental Economists
- Environmental Engineer
- Environmental Planner
- Environmental Research Analyst
- Environmental Restoration Planners
- Environmental Science and Protection Technician
- Environmental Science Professor
- Environmental Technician
- Forest and Conservation Technician
- Forest and Conservation Workers
- Forest Fire Inspectors and Prevention Specialist
- Forester
- Geographer
- Geologist
- Geophysicist
- Hazardous Waste Management Analyst
- Hydrographer
- Hydrologist
- Industrial Air Pollution Analyst
- Industrial Ecologists
- Industrial Waste Inspector
- Landfill Inspectors
- Medical Equipment Technician
- Microbiologist
- Park Naturalist
- Seismologist
- Soil Conservation Technician
- Soil Scientist
- Urban and Regional Planner
- Water Pollution Control Inspector
- Wildlife Biologist
- Zoologist

Explore North Carolina's central online resource for students, parents, educators, job seekers and career counselors looking for high quality job and career information.

Occupational Outlook Handbook (<https://www.bls.gov/ooh/>)

Browse the Occupational Outlook Handbook published by the Bureau of Labor Statistics to view state and area employment and wage statistics. You can also identify and compare similar occupations based on your interests.

Career One Stop Videos (<https://www.careeronestop.org/>)

View videos that provide career details and information on wages, employment trends, skills needed, and more for any occupation. Sponsored by the U.S. Department of Labor.

Focus 2 Career Assessment (<https://careers.dasa.ncsu.edu/explore-careers/career-assessments/>) (NC State student email address required)

This career, major and education planning system is available to current NC State students to learn about how your values, interests, competencies, and personality fit into the NC State majors and your future career. An NC State email address is required to create an account. Make an appointment with your career counselor (<https://careers.dasa.ncsu.edu/about/hours-appointments/>) to discuss the results.

Focus 2 Apply Assessment (<https://www.focus2career.com/Portal/Register.cfm?SID=1929>) (Available to prospective students)

A career assessment tool designed to support prospective students in exploring and choosing the right major and career path based on your unique personality, interests, skills and values. Get started with Focus 2 Apply and see how it can guide your journey at NC State.

National Association of Environmental Professionals (<http://www.naep.org/>)

## Learn More About Careers

NCCareers.org (<https://nccareers.org/>)