ENVIRONMENTAL SCIENCE

Interdepartmental Undergraduate Programs

Environmental Science provides an integrated, quantitative, and interdisciplinary approach to the study of environmental systems. The magnitude and complexity of environmental problems are creating a growing need for scientists with rigorous, interdisciplinary training in environmental science. The Environmental Science program is designed to prepare students for positions of leadership in this rapidly changing discipline. Environmental Science graduates have a solid foundation in biological and physical natural sciences and the specialized training necessary for integrated analysis of environmental systems.

Undergraduate Study

The Environmental Science undergraduate major is offered through both the College of Agriculture and Life Sciences and the College of Liberal Arts and Sciences. Environmental Science majors complete foundation courses in biology, chemistry, earth science, geology, physics and mathematics, plus a major consisting of an integrated core of Environmental Science courses and additional advanced course work in Environmental Science. Scientific rigor is stressed throughout the program, beginning with the foundation courses in the first two years of the curriculum. The upper level core courses emphasize a dynamic systems approach that provides a framework for integrating physical, chemical, and biological aspects of environmental systems.

Student Learning Outcomes

Upon graduation, students should be able to:

Demonstrate a broad understanding of environmental systems and issues utilizing an interdisciplinary framework to integrate ideas and concepts from biological and physical natural sciences

Demonstrate proficiency in data analysis and problem-solving of relevant environmental systems/problems

Use a systems approach to conduct integrated, quantitative, and interdisciplinary analyses and modeling of environmental systems and problems

College of Agriculture and Life Sciences

Students seeking an Environmental Science major complete the following:

1. A foundation of approved supporting courses in science and mathematics including biology, chemistry, earth science, physics, calculus, and statistics.

2. 32 credits of course work in the major, including a required core of 20 credits.

A combined average grade of C or higher is required in courses applied in the major.

1. Environmental Science: 32 credits

ENSCI 110	Orientation to Environmental Science	1
ENSCI 201	Introduction to Environmental Issues	2
ENSCI 202	Exploration of Environmental and Sustainability Issues	1
ENSCI 203	Exploration of Environmental Science	1
ENSCI 250	Environmental Geography	3
ENSCI 251	Biological Processes in the Environment	3
ENSCI 381	Environmental Systems I: Introduction to Environmental Systems	3
ENSCI 382	Environmental Systems II: Analysis of Environmental Systems	3
ENSCI 384	Introduction to Ecosystems	3
Additional ENSCI choice courses		12
Total Credits		**32**

2. Mathematics & Statistics: 7-8 credits

Choose one of the following:		4
MATH 160	Survey of Calculus	
MATH 165	Calculus I	
Choose one of the following:		3-4
STAT 101	Principles of Statistics	
STAT 104	Introduction to Statistics	
Total Credits		**7-8**

3. Physical & Life Sciences: 21-24 credits

BIOL 101	Introductory Biology	3
or BIOL 211	Principles of Biology I	
Choose from one of the following:		5-6
CHEM 163 & 163L	College Chemistry and Laboratory in College Chemistry	
CHEM 167 & 167L	General Chemistry for Engineering Students and Laboratory in General Chemistry for Engineering	
CHEM 177 & 177L	General Chemistry I and Laboratory in General Chemistry I	
CHEM 201 & 201L	Advanced General Chemistry and Laboratory in Advanced General Chemistry	
Choose from one of the following:		3-4
CHEM 231 & 231L	Elementary Organic Chemistry and Laboratory in Elementary Organic Chemistry	
CHEM 331 & 331L	Organic Chemistry I and Laboratory in Organic Chemistry I	

BBMB 221	Structure and Reactions in Biochemical Processes	
AGRON 259	Organic Compounds in Plants and Soils	
Choose from one of the following:		4-5
PHYS 131 & 131L	General Physics I and General Physics I Laboratory	
PHYS 115	Physics for the Life Sciences	
PHYS 231 & 231L	Introduction to Classical Physics I and Introduction to Classical Physics I Laboratory	
Choose 2 of the following:		6
AGRON 182	Introduction to Soil Science	
GEOL 100	How the Earth Works	
or GEOL 201	Geology for Engineers and Environmental Scientists	
MTEOR 206	Introduction to Weather and Climate	
BIOL 212	Principles of Biology II	
CHEM 178 & 178L	General Chemistry II and Laboratory in College Chemistry II	
Total Credits		**21-24**

4. Communications: 7-10 credits

ENGL 150	Critical Thinking and Communication	3
ENGL 250	Written, Oral, Visual, and Electronic Composition	3
LIB 160	Introduction to College Level Research	1
Embedded communication coursework in ENSCI 203, ENSCI 381 and ENSCI 382		
Total Credits		**7**

Additional communication Courses required of majors in the College of Agriculture and Life Sciences

SP CM 212	Fundamentals of Public Speaking	3
or AGEDS 311	Presentation and Sales Strategies for Agricultural Audiences	
Total Credits		**3**

5. General Education: 15-21 credits

General Education requirements in the College of Agriculture and Life Sciences

Humanities	3
Social Science	3
Ethics	3
International Perspectives course from university approved list	3
US Diversity course from university approved list	3
Total Credits	**15**

General Education requirements in the College of Liberal Arts and Sciences

Arts and Humanities courses from college approved list	12
Social Science courses from college approved list	9
(Select courses to include 3 cr. of International Perspectives and 3 cr. of US Diversity)	
Students must have completed 3 years of a single world language in high school or take 4-8 credits of World Languages at the university level	
Total Credits	**21**

Electives (28-35 credits)

LAS students must earn a minimum of 45 credits at the 300-/400-level.

A minimum of 120.0 Total Credits are needed for graduation

Environmental Science, B.S.

Freshman

Fall	Credits	Spring	Credits
ENGL 150	3	BIOL 211 & 211L or Elective	3-4
ENSCI 110[1]	1	CHEM 178	3
ENSCI 201[1]	2	CHEM 178L	1
CHEM 177	4	MATH 160 or 165	4
CHEM 177L	1	Social Science or Humanities Choice[2]	3
LIB 160	1		
STAT 101 or 104	3-4		
	15-16		**14-15**

Sophomore

Fall	Credits	Spring	Credits
ENSCI 250[1]	3	ENSCI 251	3
Social Science or Humanities Choice[2]	3	Organic Chemistry Choice[3]	3
PHYS 115	4	Earth Science Choice[3]	3
ENGL 250	3	Social Science or Humanities Choice[2]	3
Elective	3	Communications (Speech)	3
	16		**15**

Junior

Fall	Credits	Spring	Credits
ENSCI 381[1]	3-4	ENSCI 382[1]	3
Environmental Science Choice[1]	3	ENSCI 384	3
Social Science or Humanities Choice[2]	3	Social Science or Humanities Choice[2]	3
Elective	6	Electives	6
	15-16		**15**

Senior

Fall	Credits	Spring	Credits
Environmental Science Choice[1]	3	Environmental Science Choice[1]	6
Elective	12	Elective	9
	15		**15**

1 Students complete at least 27 credits in Environmental Science including ENSCI 110, 201, 250, 381, 382, and 15 additional credits of approved ENSCI coursework.

2 Students complete at least 15 credits in humanities and social science including at least 3 credits each in ethics, humanities, social science, U.S. Diversity, and International Perspectives from approved lists.

3 Students choose one course from the following Earth Science related courses: AGRON 182, BIOL 212, GEOL 100, GEOL 201, MTEOR 206. Students choose from one of the following Organic Chemistry options: CHEM 231 & 231L, CHEM 331 & 331L, BBMB 221, or AGRON 259.

Graduate Study

Contact information for the graduate program:

Lynette Edsall
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https://enscigrad.iastate.edu/

The Environmental Science graduate program offers an interdepartmental curriculum leading to M.S. and Ph.D. degrees with a major in Environmental Science. Faculty from the colleges of Agriculture and Life Sciences, Engineering, and Liberal Arts and Sciences cooperate to offer courses and research opportunities covering a broad array of environmental topics. Cooperating departments include Agricultural and Biosystems Engineering; Agronomy; Animal Science; Civil, Construction and Environmental Engineering; Ecology, Evolution and Organismal Biology; and Geological and Atmospheric Sciences.

Applicants should have completed an undergraduate or master's degree in one of the biological, chemical, physical, or engineering sciences or should have equivalent preparation.

The Environmental Science Graduate Program emphasizes fundamental concepts and research, which at the same time address major environmental issues. The curriculum is designed to provide the interdisciplinary approach needed in environmental science education and research. In addition to work in their chosen area of specialization, students are afforded a broad exposure to the biological, chemical and physical aspects of environmental systems and the specialized training necessary for integrated analysis of these systems.

Information on application procedures, curriculum requirements, and faculty research areas is available on the Environmental Science Graduate Program website (https://enscigrad.iastate.edu/).