

ENVIRONMENTAL SCIENCE BACHELOR OF SCIENCE: BIOLOGICAL CONSERVATION TRACK

Program Overview

This interdisciplinary science degree prepares students in a liberal arts tradition to understand connections between human beings and their effects on the Earth's environment. Drake environmental science students are grounded in the natural sciences disciplines while also acquiring the ability to synthesize information across disciplines. Students develop technical and quantitative skills including laboratory and field methods, statistical analysis and the implementation of geographic information systems (GIS). Courses in the social sciences such as economics, politics, policy and ethics provide an important link to the human element associated with environmental issues. Graduates of the program will be well prepared to undertake graduate study in diverse fields of environmental sciences, as well as to work in governmental and nongovernmental capacities on environmental issues.

Field work is a key component of this degree, featured in biology, geology and environmental classes. Iowa's central location in the nation allows students to experience a diversity of ecosystems and human communities during frequently offered weekend and summer field trips. The program also connects students with ongoing environmental projects (for example an 8,000-acre prairie restoration project including bison and elk at the Neal Smith National Wildlife Refuge, 20 miles east of campus), with offerings at Iowa Lakeside Laboratory in Milford, Iowa (a biological field station), and with semester-long marine science experiences at the University of Southern Mississippi's Gulf Coast Research Laboratory in Ocean Springs, Mississippi.

Drake's environmental science major is distinguished by its strong focus on interdisciplinary study, emphasis on field experiences, opportunities for research and independent study, and service learning approach in the Senior Capstone experience.

B.S. Degree Requirements

The B.S. degree program is designed to provide significant experience in research. Students will become collaborators with faculty and contribute to all aspects of a research project from proposal and hypothesis formation to data analysis, interpretation and presentation. The research typically occurs at Drake University with Drake faculty, but it could also be completed during an off-campus experience with a non-Drake adviser (e.g., study abroad, local workplaces). Off-campus research still requires an ENS faculty adviser (through enrollment in ENSS 197 ENVIRONMENTAL RESEARCH).

Additional requirements for the B.S. degree:

- Collaboration with a faculty adviser in a significant research project (minimum of 2 semesters)
- Research proposal submitted to the ENS program and approved before your senior year
- BIO 140 BIOLOGY RESEARCH AND STATISTICAL METHODS, or its advisor-approved equivalent
- A minimum of 2 credits of ENSS 197 ENVIRONMENTAL RESEARCH

- Oral presentation of the research to ENS faculty and students
- Research paper and a copy of the presentation submitted to the ENS program

Students planning to complete a B.S. in ENS should obtain a copy of the full description of the B.S. requirements from their advisor or the program director by their sophomore year.

At least 25 credits in this major will include courses not counted towards another major or minor.

Environmental Science: Biological Conservation Track

Code	Title	Hours
Core Curriculum		
ENSS 035	ONE EARTH: GLOBAL ENVIRONMENTAL SCIENCE	3
ENSS 036	ONE EARTH LABORATORY	1
ENSS 037	ENVIRONMENTAL CASE ANALYSIS	3
ENSS 041	PRINCIPLES OF GEOLOGY	3
ENSS 042	PRINCIPLES OF GEOLOGY LAB	1
ENSS 065	GEOGRAPHIC INFORMATION SYSTEMS	3
ENSS 157	ENVIRONMENTAL JUSTICE	3
Life Science Base		
BIO 012 & 012L	GENERAL/PRE-PROFESSIONAL BIOLOGY I and GENERAL/PRE-PROFESSIONAL BIOLOGY I LAB (with lab)	4
BIO 013 & 013L	GENERAL/PRE-PROFESSIONAL BIOLOGY II and GENERAL/PRE-PROFESSIONAL BIOLOGY II LAB (with lab)	4
BIO 117 & BIO 118L	ECOLOGY and ECOLOGY LAB	5
Select one of the following:		3-4
BIO 140	BIOLOGY RESEARCH AND STATISTICAL METHODS	
STAT 060	STATISTICS FOR THE LIFE SCIENCES	
CHEM 001 & CHEM 003	GENERAL CHEMISTRY I and GENERAL CHEMISTRY I LAB (with lab)	4
Outcome Areas ¹		
Field and Lab Skills:		
Select two courses from the following:		6-8
ENSS 026	ETHOLOGICAL METHODS	
ENSS 101	RESTORATION ECOLOGY PRACTICUM	
ENSS 111	INTERNATIONAL ENVIRONMENT SEMINAR	
ENSS 115	ENVIRONMENTAL FIELD COURSE	
ENSS 119	REGIONAL ECOLOGY	
ENSS 125	CONSERVATION BIOLOGY ²	
ENSS 150	ADVANCED TOPICS IN ENVIRONMENTAL SCIENCE (with advisor approval)	
ENSS 165	APPLICATIONS OF GEOGRAPHIC INFORMATION SYSTEMS	
BIO 120 & 120L	ECOSYSTEM ECOLOGY and ECOSYSTEM ECOLOGY LAB	
BIO 145 & 145L	SELECTED TOPICS IN BIOLOGY and SELECTED TOPICS IN BIOLOGY LAB (with advisor approval)	
BIO 152 & 152L	FIELD BOTANY and FIELD BOTANY LAB	

Research Literacy:

Select two of the following: 6-8

ENSS 111	INTERNATIONAL ENVIRONMENT SEMINAR
ENSS 115	ENVIRONMENTAL FIELD COURSE
ENSS 119	REGIONAL ECOLOGY
ENSS 127	ENDANGERED SPECIES CONSERVATION ²
ENSS 128	ZOO DESIGN AND OPERATIONS
ENSS 150	ADVANCED TOPICS IN ENVIRONMENTAL SCIENCE (with advisor approval)
ENSS 154	ENVIRONMENTAL DECISION-MAKING
ENSS 168	DYNAMIC ENVIRONMENTAL MODELING
BIO 025/ PSY 024	ANIMAL BEHAVIOR
BIO 120 & 120L	ECOSYSTEM ECOLOGY and ECOSYSTEM ECOLOGY LAB
BIO 145 & 145L	SELECTED TOPICS IN BIOLOGY and SELECTED TOPICS IN BIOLOGY LAB (with advisor approval)
BIO 167 & 167L	POPULATION AND COMMUNITY ECOLOGY and POPULATION ECOLOGY LAB

Taxon Expertise:

Select two courses from the following: 6-8

ENSS 109	ZOO/GREAT APE PRACTICUM
ENSS 111	INTERNATIONAL ENVIRONMENT SEMINAR
ENSS 115	ENVIRONMENTAL FIELD COURSE
ENSS 119	REGIONAL ECOLOGY
ENSS 150	ADVANCED TOPICS IN ENVIRONMENTAL SCIENCE (with advisor approval)
ENSS 159	ZOO/GREAT APE INTERNSHIP
BIO 019 & 019L	INTRODUCTION TO BOTANY and BOTANY LAB
BIO 098	INTRODUCTION TO PRIMATOLOGY
BIO 112L	AVIAN WINTER ECOLOGY
BIO 119 & 119L	HERPETOLOGY and HERPETOLOGY LAB
BIO 122 & 122L	MAMMALOGY and MAMMOLOGY LAB
BIO 130 & 130L	ORNITHOLOGY and ORNITHOLOGY LAB
BIO 145 & 145L	SELECTED TOPICS IN BIOLOGY and SELECTED TOPICS IN BIOLOGY LAB (with advisor approval)
BIO 152 & 152L	FIELD BOTANY and FIELD BOTANY LAB

Managing Biodiversity:

Select two of the following: 6-8

ENSS 101	RESTORATION ECOLOGY PRACTICUM
ENSS 111	INTERNATIONAL ENVIRONMENT SEMINAR
ENSS 115	ENVIRONMENTAL FIELD COURSE
ENSS 119	REGIONAL ECOLOGY
ENSS 125	CONSERVATION BIOLOGY ²
ENSS 127	ENDANGERED SPECIES CONSERVATION ²
ENSS 128	ZOO DESIGN AND OPERATIONS

ENSS 135	GLOBAL CLIMATE CHANGE: THE SCIENCE AND POLICY OF GLOBAL WARMING ²
ENSS 138	WATER RESOURCES AND POLICY ²
ENSS 150	ADVANCED TOPICS IN ENVIRONMENTAL SCIENCE (with advisor approval)
ENSS 168	DYNAMIC ENVIRONMENTAL MODELING
BIO 145 & 145L	SELECTED TOPICS IN BIOLOGY and SELECTED TOPICS IN BIOLOGY LAB

Science-Policy Integration

Select six ENSS credits from courses advisor-approved courses that combine significant conservation-related content within the context of important discussions in the policy realm. Students may complete this requirement using courses that fulfill programmatic learning outcomes 6

Capstone

ENSS 191	ENVIRONMENTAL SCIENCE AND SUSTAINABILITY PRACTICUM	3
ENSS 197	ENVIRONMENTAL RESEARCH	2

¹ Any course may count toward only one outcome.

² Students may complete this requirement using courses that fulfill programmatic learning outcomes

In addition to programmatic requirements, students are responsible for satisfying all requirements of the Drake Curriculum (<https://catalog.drake.edu/archive/2024-2025/undergraduate/academic-information/drake-curriculum/>), including Areas of Inquiry (AOI)

Student must also satisfy university graduation requirements (<https://catalog.drake.edu/archive/2024-2025/undergraduate/academic-information/graduation-requirements/>) for all undergraduate students..