

Environmental Science B.A. or B.S.

Environmental Science B.A. Major

The B.A. Environmental Science major requires a minimum of 120 total hours to graduate. This total includes UNIFI/General Education requirements and the following specified major requirements, plus electives to complete the minimum of 120 hours.

The Environmental Science major is intended as a hands-on program with all students having a common curricular core centered on Geology and Meteorology, as well as Geography, Biology, Environmental Policies, Mathematics, and Chemistry. Following the common core courses students take supporting courses in areas of professional interest – Air Quality, Geoscience, or Hydrology. Each has a range of courses that provide students with experience in evaluating and responding to environmental issues. Please contact the Earth and Environmental Sciences Office for a list of current supporting courses.

Required

BIOL 2051	General Biology: Organismal Diversity	4
CHEM 1110	General Chemistry I	4
EARTHSCI 1200	Elements of Weather	3
EARTHSCI 1300	Introduction to Geology	4
EARTHSCI 3230/5230	Air Quality	4
EARTHSCI 3345/5345	Environmental Geology	3
EARTHSCI 3350/5350	Environmental Hydrology	3
EARTHSCI 3430	Internship	2
or EARTHSCI 4400	Undergraduate Research in Earth and Environmental Science	
GEOG 2410	Geographic Information Systems I	3
MATH 1140	Precalculus	4
or MATH 1420	Calculus I	
STAT 1772	Introduction to Statistical Methods	3
Electives:		25
Primary Focus - At least 18 hours from the following:		
EARTHSCI 1320	Earth History	
EARTHSCI 3210/5210	Meteorology	
EARTHSCI 3240/5240	Air Quality Modeling	
EARTHSCI 3250/5250	Measurement and Analysis of Air Quality	
EARTHSCI 3322	Earth Materials	
EARTHSCI 3323	Geochemistry of the Land	
EARTHSCI 3325/5325	Sedimentary Geology *	
EARTHSCI 3327/5327	Paleoclimatology *	
EARTHSCI 3330/5330	Geomorphology	
EARTHSCI 3340/5340	Oceanography	
EARTHSCI 3355/5355	Hydrogeology	
EARTHSCI 3360/5360	Field and Laboratory Methods in Hydrology	
EARTHSCI 3365/5365	Hydrology Seminar	

EARTHSCI 3370	Geologic Field Methods
Secondary Focus - At least 7 hours from the following:	
CHEM 1120	General Chemistry II
CHEM 3305/5305	Environmental Chemistry
CONSTR 1015	Introduction to Sustainability
EARTHSCI 1400	Introduction to Environmental Earth Science
EARTHSCI 3336	Natural Resources and Civilizations
EARTHSCI 3367	Global Water Environment
ECON 3225/5225	Environmental Economics *
GEOG 2210	Modern Climate Change: Evidence and Predictions
GEOG 2260	Environmental Resource Management
GEOG 2350	Intro to Environmental Data Analysis
GEOG 4115/5115	Climate Change and Social Justice
GEOG 4220/5220	Soils and Landscapes
GEOG 4230/5230	Rivers
GEOG 4320/5320	Geographic Information Systems II
GEOG 4370/5370	Remote Sensing of the Environment
PH 3710	Environmental Health Science
PHIL 2550	Environmental Ethics
PHYSICS 1511	General Physics I
Other courses approved by the Department	
Total Hours	62

* ECON 3225/5225 has prerequisites of ECON 1041; ECON 1051; junior standing.

EARTHSCI 3325/5325 has a prerequisite or corequisite of EARTHSCI 1320 and prerequisite junior standing.

EARTHSCI 3327/5327 has prerequisites of EARTHSCI 1300 OR GEOG 1210; EARTHSCI 1320 or consent of instructor; junior standing.

Environmental Science B.S. Major

The B.S. Environmental Science major requires a minimum of 120 total hours to graduate. This total includes UNIFI/General Education requirements and the following specified major requirements, plus electives to complete the minimum of 120 hours.

The B.S. Environmental Science program will include two curricular paths for students, one with a life science emphasis and the other with an earth science emphasis. The program will enable students to prepare for a graduate program in the environmental sciences or to directly enter industry in the public or private sector. All students will have a common core of courses providing a foundation in biology

Environmental Science B.A. or B.S.

and geosciences, and will also be required to take part in a capstone research project.*

For students pursuing the B.S. Environmental Science major, the Department of Biology will waive BIOL 2052 as a prerequisite for BIOL 3000-level courses.

For students pursuing the B.S. Environmental Science major, the Department of Biology will waive BIOL 3140 as a prerequisite for BIOL 4000-level courses.

A student with a major in the interdisciplinary B.S. Environmental Science: Environmental Life Science Track may not also declare a major or minor in biology.

Required Core

BIOL 2051	General Biology: Organismal Diversity	4
BIOL 3100	Evolution, Ecology and the Nature of Science	3
Chemistry and Biochemistry		5-8
CHEM 1110 & CHEM 1120 or CHEM 1130	General Chemistry I and General Chemistry II or General Chemistry I-II	
EARTHSCI 1200	Elements of Weather	3
EARTHSCI 1300	Introduction to Geology	4
GEOG 2410	Geographic Information Systems I	3
MATH 1420	Calculus I	4
BIOL 3190 or EARTHSCI 4400	Undergraduate Research in Biology or Undergraduate Research in Earth and Environmental Science	3
Choose one of the following tracks outlined below:		33
Environmental Life Sciences Track		
Environmental Earth Science Track		
Total Hours		62-65

Environmental Life Sciences Track

Required:		
BIOL 4157/5157	Biostatistics	3
BIOL 4168/5168	Ecology	4
Electives: 26		
Pick courses from each of the three categories (A, B, & C) to accumulate to a minimum of 26 hours.		
Category A - Content Policy Related Courses (select a minimum of 2 courses)		
BIOL 4105/5105	Wildlife Ecology and Management	
BIOL 4108/5108	Biodiversity Conservation Policy	
BIOL 4167/5167	Conservation Biology	
BIOL 4180/5180	Restoration Ecology	
Category B - Content Biology Related Courses (select a minimum of 2 courses)		
BIOL 3109/5109	Plants of North America	
BIOL 3120	Plant Diversity and Evolution	

BIOL 3151	General Microbiology	
BIOL 3170	Entomology	
BIOL 4164/5164	Mammalogy	
Category C - Cognates (select a minimum of 2 courses)		
CHEM 2040	Applied Organic and Biochemistry	
or CHEM 2210	Organic Chemistry I	
EARTHSCI 1320	Earth History	
EARTHSCI 3210/5210	Meteorology	
EARTHSCI 3230/5230	Air Quality	
EARTHSCI 3325/5325	Sedimentary Geology	
EARTHSCI 3330/5330	Geomorphology	
EARTHSCI 3340/5340	Oceanography	
EARTHSCI 3345/5345	Environmental Geology	
EARTHSCI 3350/5350	Environmental Hydrology	
EARTHSCI 3355/5355	Hydrogeology	
EARTHSCI 3360/5360	Field and Laboratory Methods in Hydrology	
GEOG 2210	Modern Climate Change: Evidence and Predictions	
GEOG 3220	Environmental Geography: Variable Topic **	
GEOG 4370/5370	Remote Sensing of the Environment	
GEOG 4320/5320	Geographic Information Systems II	
GEOG 4220/5220	Soils and Landscapes	
GEOG 4230/5230	Rivers	
GEOG 4240/5240	The Ice Age **	
MATH 1421	Calculus II	

Total Hours 33

Environmental Earth Science Track

Required:		
EARTHSCI 3230/5230	Air Quality	4
EARTHSCI 3345/5345	Environmental Geology	3
EARTHSCI 3350/5350	Environmental Hydrology	3
Electives: 23		
Pick courses from each of the Categories (A & B) to accumulate a minimum of 23 hours		
Category A - Physical Environment Related Courses (select a minimum of 4 courses)		
EARTHSCI 1320	Earth History	
EARTHSCI 3210/5210	Meteorology	
EARTHSCI 3240/5240	Air Quality Modeling	
EARTHSCI 3250/5250	Measurement and Analysis of Air Quality	
EARTHSCI 3322	Earth Materials	
EARTHSCI 3323	Geochemistry of the Land	
EARTHSCI 3325/5325	Sedimentary Geology	
EARTHSCI 3327/5327	Paleoclimatology	
EARTHSCI 3330/5330	Geomorphology	
EARTHSCI 3340/5340	Oceanography	
EARTHSCI 3355/5355	Hydrogeology	

EARTHSCI 3360/536	Field and Laboratory Methods in Hydrology	
Category B - Cognates (select a minimum of 2 courses)		
BIOL 3109/5109	Plants of North America	
BIOL 3120	Plant Diversity and Evolution	
BIOL 3170	Entomology	
BIOL 4105/5105	Wildlife Ecology and Management	
BIOL 4108/5108	Biodiversity Conservation Policy	
BIOL 4157/5157	Biostatistics	
BIOL 4164/5164	Mammalogy	
BIOL 4167/5167	Conservation Biology	
BIOL 4168/5168	Ecology	
BIOL 4180/5180	Restoration Ecology	
CHEM 2040	Applied Organic and Biochemistry	
or CHEM 2210	Organic Chemistry I	
CHEM 3305/5305	Environmental Chemistry	
GEOG 2210	Modern Climate Change: Evidence and Predictions	
GEOG 3220	Environmental Geography: Variable Topic **	
GEOG 4220/5220	Soils and Landscapes	
GEOG 4320/5320	Geographic Information Systems II	
GEOG 4230/5230	Rivers	
GEOG 4240/5240	The Ice Age **	
GEOG 4370/5370	Remote Sensing of the Environment	
MATH 1421	Calculus II	
Total Hours		33

* Students must receive a grade of C- (1.67) or higher in courses that are applied to their major. Prior to enrollment in a course, all prerequisites must be completed with a C- (1.67) or higher.

**These courses have additional prerequisites as follows:
 GEOG 3220 has a prerequisite of GEOG 1120 or GEOG 1210 or GEOG 2210 or GEOG 1110 or consent of instructor.
 GEOG 4240/5240 has prerequisite of GEOG 1210; GEOG 2210; EARTHSCI 1300.

Four-Year Plan Environmental Science, B.A.

This is a sample plan of study with a suggested sequencing of classes for the major. University electives may be applied to earn additional academic majors, minors, or certificates. Students should regularly meet with their academic advisor to plan their specific semester schedule to include UNIFI/General Education program and/or university elective hours required.

Course	Title	Hour
Freshman		
Fall		
CHEM 1110	General Chemistry I	4

UNIV 1000	First-Year Cornerstone: Integrated Communication I	3
EARTHSCI 1300	Introduction to Geology	4
UNIFI/General Education or University Electives		3
Hours		14
Spring		
UNIV 1010	First-Year Cornerstone: Integrated Communication II	3
EARTHSCI 1200	Elements of Weather	3
MATH 1140 Precalculus (or MATH 1420)		4
UNIFI/General Education or University Electives		6
Hours		16
Sophomore		
Fall		
GEOG 2410	Geographic Information Systems I	3
STAT 1772	Introduction to Statistical Methods	3
Environmental Science Electives		3
UNIFI/General Education or University Electives		6
Hours		15
Spring		
BIOL 2051	General Biology: Organismal Diversity	4
Environmental Science Electives		5
UNIFI/General Education or University Electives		6
Hours		15
Junior		
Fall		
EARTHSCI 3230/5230	Air Quality	4
EARTHSCI 3345/5345	Environmental Geology	3
Environmental Science Electives		5
UNIFI/General Education or University Electives		3
Hours		15
Spring		
EARTHSCI 3350/5350	Environmental Hydrology	3
Environmental Science Electives		3
UNIFI/General Education or University Electives		9
Hours		15
Senior		
Fall		
EARTHSCI 3430 or EARTHSCI 4400		2
Environmental Science Electives		6
UNIFI/General Education or University Electives		7
Hours		15
Spring		
PH 3710	Environmental Health Science (or PH 3720 Environmental and Occupational Health Regulations)	3
UNIFI/General Education or University Electives		12
Hours		15
Total Hours		120

Environmental Science, B.S.

This is a sample plan of study with a suggested sequencing of classes for the major. University electives may be applied to earn additional academic majors, minors, or certificates. Students should regularly meet with their academic advisor to plan their specific semester schedule to include UNIFI/General Education program and/or university elective hours required.

Environmental Science B.A. or B.S.

Environmental Earth Science Track

Course	Title	Hour
Freshman		
Fall		
BIOL 2051	General Biology: Organismal Diversity	4
EARTHSCI 1300	Introduction to Geology	4
UNIV 1000	First-Year Cornerstone: Integrated Communication I	3
UNIFI/General Education or University Electives		3
Hours		14
Spring		
EARTHSCI 1200	Elements of Weather	3
MATH 1420	Calculus I	4
UNIV 1010	First-Year Cornerstone: Integrated Communication II	3
UNIFI/General Education or University Electives		6
Hours		16
Sophomore		
Fall		
CHEM 1110	General Chemistry I	4
Environmental Science Electives		6
UNIFI/General Education or University Electives		6
Hours		16
Spring		
CHEM 1120	General Chemistry II	4
GEOG 2410	Geographic Information Systems I	3
Environmental Science Electives		3
UNIFI/General Education or University Electives		6
Hours		16
Junior		
Fall		
BIOL 3100	Evolution, Ecology and the Nature of Science	3
Environmental Science Electives		3
UNIFI/General Education or University Electives		9
Hours		15
Spring		
Environmental Science Electives		6
UNIFI/General Education or University Electives		9
Hours		15
Senior		
Fall		
Environmental Science Electives		9
UNIFI/General Education or University Electives		6
Hours		15
Spring		
BIOL 3190	Undergraduate Research in Biology (or EARTHSCI 4400 Undergraduate Research in Earth and Environmental Science)	3
Environmental Science Electives		6
UNIFI/General Education or University Electives		4
Hours		13
Total Hours		120

Environmental Life Science Track

This is a sample plan of study with a suggested sequencing of classes for the major. University electives may be applied to earn additional academic majors, minors, or certificates. Students should regularly meet with their academic advisor to plan their specific semester

schedule to include UNIFI/General Education program and/or university elective hours required.

Course	Title	Hour
Freshman		
Fall		
BIOL 2051	General Biology: Organismal Diversity	4
CHEM 1110	General Chemistry I	4
UNIFI/General Education or University Electives		6
Hours		14
Spring		
CHEM 1120	General Chemistry II	4
EARTHSCI 1200	Elements of Weather	3
MATH 1420	Calculus I	4
UNIFI/General Education or University Electives		3
Hours		14
Sophomore		
Fall		
BIOL 3100	Evolution, Ecology and the Nature of Science	3
EARTHSCI 1300	Introduction to Geology	4
Environmental Science Electives		4
UNIFI/General Education or University Electives		3
Hours		14
Spring		
GEOG 2410	Geographic Information Systems I	3
Environmental Science Electives		4
UNIFI/General Education or University Electives		9
Hours		16
Junior		
Fall		
BIOL 4168/5168	Ecology	4
Environmental Science Electives		8
UNIFI/General Education or University Electives		3
Hours		15
Spring		
BIOL 3190	Undergraduate Research in Biology	3
Environmental Science Electives		3
UNIFI/General Education or University Electives		10
Hours		16
Senior		
Fall		
BIOL 4157/5157	Biostatistics	3
UNIFI/General Education or University Electives		12
Hours		15
Spring		
Environmental Science Electives		7
UNIFI/General Education or University Electives		9
Hours		16
Total Hours		120

Learning Outcomes

Environmental Science, B.A.

Goal 1 - Critical Thinking & Data Analysis: Our students will use concepts from Environmental Science to critically analyze and interpret scientific data.

- **Outcome 1.1** - Analyze and interpret scientific data to formulate an evidence-based conclusion
- **Outcome 1.2** - Use a variety of mathematical tools and computer software to describe scientific phenomena and answer scientific questions

Goal 2 - Communication: Our students will be able to communicate concepts from Environmental Science.

- **Outcome 2.1** - Create a well-written report or paper that summarizes scientific data and draws evidence-based conclusions
- **Outcome 2.2** - Create and deliver a well-constructed oral report that summarizes scientific data and draws evidence-based conclusions

Goal 3 - Content Knowledge and Skills: Our students will apply concepts and theories from Environmental Science to the real world.

- **Outcome 3.1** - Describe fundamental theories and concepts in Environmental Science
- **Outcome 3.2** - Use concepts and theories from Environmental Science to create a model of a complex system
- **Outcome 3.3** - Use concepts and theories from Environmental Science to solve a real-world problem
- **Outcome 3.4** - Use scientific equipment to collect valid scientific data.

Environmental Science, B.S.

Goal 1 - Critical Thinking & Data Analysis: Our students will use concepts from Environmental Science to critically analyze and interpret scientific data.

- **Outcome 1.1** - Analyze and interpret scientific data to formulate an evidence-based conclusion
- **Outcome 1.2** - Use a variety of mathematical tools and computer software to describe scientific phenomena and answer scientific questions

Goal 2 - Communication: Our students will be able to communicate concepts from Environmental Science.

- **Outcome 2.1** - Create a well-written report or paper that summarizes scientific data and draws evidence-based conclusions
- **Outcome 2.2** - Create and deliver a well-constructed oral report that summarizes scientific data and draws evidence-based conclusions
- **Outcome 2.3** - Create and deliver a research project report in both a written and oral format.

Goal 3 - Content Knowledge and Skills: Our students will apply concepts and theories from Environmental Science to the real world.

- **Outcome 3.1** - Describe fundamental theories and concepts in Environmental Science
- **Outcome 3.2** - Use concepts and theories from Environmental Science to create a model of a complex system
- **Outcome 3.3** - Use concepts and theories from Environmental Science to solve a real-world problem
- **Outcome 3.4** - Use scientific equipment to collect valid scientific data.

- **Outcome 3.5** - Develop, and carry through an independent research project and communicate the findings.

Related Programs

- Biology Minor
- Geology Minor