

BACHELOR OF SCIENCE (BS) DEGREE WITH A MAJOR IN ENVIRONMENTAL SCIENCE AND A MAJOR CONCENTRATION IN ECOLOGY AND EVOLUTIONARY BIOLOGY

Program Learning Outcomes for the BS Degree with a Major in Environmental Science

Upon completing the BS degree with a major in Environmental Science, students will be able to:

1. Demonstrate foundational knowledge in the natural sciences that is fundamental to the environmental sciences or application of the environmental sciences to other fields.
2. Integrate knowledge of natural and applied sciences to understand complex natural systems and cycles.
3. Synthesize knowledge from natural sciences and engineering and apply it to the study of the environment.
4. Understand environmental issues from a scientific perspective and be able to solve issues using a variety of interdisciplinary perspectives (e.g., social sciences, economics, humanities, and/or architecture).
5. Demonstrate knowledge and skills suitable for doing research and/or field studies in environmental science.

Requirements for the BS Degree with a Major in Environmental Science

For graduation requirements, see [Graduation Requirements \(https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/\)](https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/). Students pursuing the BS degree with a major in Environmental Science must complete:

- A minimum of 26-29 courses (76-82 credit hours), depending on course selection, to satisfy major requirements.
- A minimum of 120 credit hours to satisfy degree requirements.
- A minimum of 5-7 courses (15-24 credit hours), depending on declared major concentration, taken at the 300-level or above.
- An advanced field or research experience requirement.
- A capstone senior seminar requirement.
- The requirements of a major concentration. When students **declare the major** (<https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/#text>) in Environmental Science, students must additionally identify and declare one of two major concentrations, either in:
 - [Earth Science \(https://ga.rice.edu/programs-study/departments-programs/natural-sciences/environmental-science/environmental-science-bs-earth-science-concentration/#Earth_Science\)](https://ga.rice.edu/programs-study/departments-programs/natural-sciences/environmental-science/environmental-science-bs-earth-science-concentration/#Earth_Science), **or**
 - [Ecology and Evolutionary Biology](#) (p. 4).

Because of the common core requirements, it is possible for students to change their major concentration at any time, even after initially declaring the major. To do so, please contact the [Office of the Registrar \(registrar@rice.edu\)](mailto:registrar@rice.edu).

Environmental Science is an interdisciplinary major that addresses environmental issues in the context of what we know about earth, ecology, and society. In addition to its science core, the major also seeks to provide students with some appreciation of social, cultural, and policy dimensions of environmental issues.

The courses listed below satisfy the requirements for this major. In certain instances, courses not on this official list may be substituted upon approval of the major's academic advisor, or where applicable, the department's Director of Undergraduate Studies. (Course substitutions must be formally applied and entered into Degree Works by the major's [Official Certifier \(https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/\)](https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/).) Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

| Code | Title | Credit Hours |
|---|-------|--------------|
| Total Credit Hours Required for the Major in Environmental Science | | 76-82 |
| Total Credit Hours Required for the BS Degree with a Major in Environmental Science | | 120 |

Degree Requirements

| Code | Title | Credit Hours |
|------|-------|--------------|
|------|-------|--------------|

Core Requirements

| Foundation Coursework | | |
|-------------------------|--|---|
| BIOS 201 | INTRODUCTORY BIOLOGY I | 3 |
| BIOS 202 | INTRODUCTORY BIOLOGY II | 3 |
| BIOS 332 | ECOLOGY | 3 |
| CHEM 121 or CHEM 111 | GENERAL CHEMISTRY I AP/OTH CREDIT IN GENERAL CHEMISTRY I | 3 |
| CHEM 123 or CHEM 113 | GENERAL CHEMISTRY LABORATORY I AP/OTH CREDIT IN GENERAL CHEMISTRY LAB I | 1 |
| CHEM 122 or CHEM 112 | GENERAL CHEMISTRY II AP/OTH CREDIT IN GENERAL CHEMISTRY II | 3 |
| CHEM 124 or CHEM 114 | GENERAL CHEMISTRY LABORATORY II AP/OTH CREDIT IN GENERAL CHEMISTRY LAB II | 1 |
| MATH 101 or MATH 105 | SINGLE VARIABLE CALCULUS I AP/OTH CREDIT IN CALCULUS I | 3 |
| MATH 102 or MATH 106 | SINGLE VARIABLE CALCULUS II AP/OTH CREDIT IN CALCULUS II | 3 |
| STAT 280 or STAT 305 | ELEMENTARY APPLIED STATISTICS ¹ INTRODUCTION TO STATISTICS FOR BIOSCIENCES | 4 |

Select 1 course from the following: 3-4

| | | |
|------------------------|---|--|
| PHYS 101 & PHYS 103 | MECHANICS (WITH LAB) and MECHANICS DISCUSSION | |
| PHYS 111 | HONORS MECHANICS (WITH LAB) | |
| PHYS 125 PHYS 141 | GENERAL PHYSICS (WITH LAB) CONCEPTS IN PHYSICS I | |

Data and Quantitation

Select 1 from the following: 3-4

| | | |
|---------------------|--|--|
| BIOS 338 | ANALYSIS AND VISUALIZATION OF BIOLOGICAL DATA | |
| BIOS 470 | COMPUTATION WITH BIOLOGICAL DATA | |
| CEVE 421 | CLIMATE RISK MANAGEMENT | |
| COMP 140 | COMPUTATIONAL THINKING | |
| DSCI 101 | INTRODUCTION TO DATA SCIENCE | |
| EEPS 220 | INTRODUCTION TO COMPUTATION IN THE EARTH, ENVIRONMENT AND PLANETARY SCIENCES | |
| EEPS 435 | REMOTE SENSING | |
| EEPS 436 | GIS FOR SCIENTISTS AND ENGINEERS | |
| PHYS 102 & PHYS 104 | ELECTRICITY & MAGNETISM (WITH LAB) and ELECTRICITY AND MAGNETISM DISCUSSION | |
| PHYS 112 | HONORS ELECTRICITY & MAGNETISM (WITH LAB) | |
| PHYS 126 | GENERAL PHYSICS II (WITH LAB) | |
| PHYS 142 | CONCEPTS IN PHYSICS II | |

Core Courses²

| | | |
|---|--|---|
| BIOS 213 | INTRODUCTORY LAB IN ECOLOGY & EVOLUTION | 2 |
| ENST 100 / ARCH 105 | ENVIRONMENT, CULTURE AND SOCIETY | 3 |
| Any course (minimum 3 credit hours) from Earth, Environmental, and Planetary Sciences (EEPS) courses offerings at the 100-level (any course offerings between course numbers EEPS 100 and EEPS 199) | | 3 |
| EEPS 321 | EARTH AND PLANETARY SURFACE ENVIRONMENTS | 4 |
| EEPS 325 | OCEANS, ATMOSPHERES AND CLIMATE | 4 |

Field Experience

Select 1-2 courses from the following: 2-3

| | | |
|---------------------|---|--|
| BIOS 204 | ENVIRONMENTAL SUSTAINABILITY: THE DESIGN & PRACTICE OF COMMUNITY AGRICULTURE ³ | |
| BIOS 316 | LAB MODULE IN ECOLOGY | |
| BIOS 317 | LAB MODULE IN BEHAVIOR | |
| BIOS 319 | TROPICAL FIELD BIOLOGY | |
| BIOS 320 | ECOLOGY AND CONSERVATION OF BRAZILIAN WETLANDS LABORATORY | |
| BIOS 327 | BIOLOGICAL DIVERSITY | |
| BIOS 330 | INSECT BIOLOGY LAB | |
| BIOS 337 | FIELD BIRD BIOLOGY LAB | |
| EEPS 103 | FIELD TRIPS FOR THE EARTH | |
| EEPS 309 / FOTO 390 | VISUALIZING NATURE | |
| EEPS 334 | THE EARTH LABORATORY | |

Major Concentration

Select 1 from the following Major Concentrations (see below for Major Concentration requirements): 9-12

Earth Science

Ecology and Evolutionary Biology

Advanced Electives⁴

Social Sciences

Select 1 course from the following: 3

| | | |
|---------------------|---|--|
| ANTH 210 | FOOD, CULTURE, CLIMATE: EATING AND GROWING IN TIMES OF ECO-UPHEAVAL | |
| ANTH 303 | INTRODUCTION TO ARCHAEOLOGICAL SCIENCE | |
| ANTH 315 | ZOOARCHAEOLOGY | |
| ANTH 348 | ANTHROPOLOGIES OF NATURE | |
| ANTH 352 | PEOPLE AND ANIMALS IN THE PAST | |
| ANTH 355 | SPACE, PLACE, AND LANDSCAPE | |
| ANTH 381 | MEDICAL ANTHROPOLOGY | |
| ECON 485 | THE ECONOMICS OF SUSTAINABILITY, CONSERVATION, AND PANDEMICS | |
| ENST 301 | ENVIRONMENTAL JUSTICE | |
| ENST 302 / SOCI 304 | ENVIRONMENTAL ISSUES: RICE INTO THE FUTURE | |
| ENST 312 | JUSTICE IN THE FOOD SYSTEM | |
| ENST 332 / ANTH 332 | THE SOCIAL LIFE OF CLEAN ENERGY | |
| ENST 367 / SOCI 367 | ENVIRONMENTAL SOCIOLOGY | |
| ENST 437 / ECON 437 | ENERGY ECONOMICS | |
| POLI 332 | URBAN POLITICS | |
| POLI 362 | COMPARATIVE URBAN POLITICS AND POLICY | |
| SOCI 313 | DEMOGRAPHY | |
| SOCI 368 | SOCIOLOGY OF DISASTER | |
| SOCI 423 | SOCIOLOGY OF FOOD | |

Humanities and Architecture

Select 1 course from the following: 3

| | | |
|---------------------|---|--|
| ENGL 269 / ENST 265 | SCIENCE FICTION AND THE ENVIRONMENT | |
| ENGL 310 | NONFICTION NATURE WRITING | |
| ENGL 358 | CONSUMPTION AND CONSUMERISM | |
| ENGL 459 | STUDIES IN LITERATURE AND ECOLOGY | |
| ENST 202 / HUMA 202 | CULTURE, ENERGY, AND THE ENVIRONMENT: AN INTRODUCTION TO ENERGY HUMANITIES | |
| ENST 205 | RECKONING WITH THE ANTHROPOCENE | |
| ENST 313 / ARCH 313 | CASE STUDIES IN SUSTAINABLE DESIGN | |
| ENST 322 / ARCH 322 | CASE STUDIES IN SUSTAINABILITY: THE REGENERATIVE REPOSITIONING OF NEW OR EXISTING RICE CAMPUS BLDGS | |
| ENST 368 / ENGL 368 | LITERATURE AND THE ENVIRONMENT | |

| | |
|---|---|
| ENST 445 | SEMINAR IN URBAN SUSTAINABILITY AND LIVABILITY RESEARCH METHODS AND APPLICATIONS |
| ENST 446 | LAB IN ENGAGED URBAN SUSTAINABILITY AND LIVABILITY RESEARCH |
| HART 302 | FROM THE SUBLIME TO THE SUSTAINABLE: ART, ARCHITECTURE AND NATURE |
| HIST 321 | US ENVIRONMENTAL HISTORY |
| HIST 470 | ENCOUNTERING THE ENVIRONMENT: CASE STUDIES FROM THE GARDEN OF EDEN TO THE SPACE AGE |
| SPAN 403 | LITERATURE AND THE ENVIRONMENT IN LATIN AMERICA |
| Natural Sciences and Engineering ⁵ | |
| Select 1 course from the following: 3-4 | |
| BIOS 280 | SUSTAINABLE DEVELOPMENT AND REPORTING |
| BIOS 559 | SUSTAINABILITY IMPACT ASSESSMENTS |
| CEVE 302 / ENGI 302 | SUSTAINABLE DESIGN |
| CEVE 308 | INTRODUCTION TO AIR POLLUTION CONTROL |
| CEVE 310 | PRINCIPLES OF ENVIRONMENTAL ENGINEERING |
| CEVE 314 / BIOE 365 / GLHT 314 | SUSTAINABLE WATER PURIFICATION FOR THE DEVELOPING WORLD |
| CEVE 323 | APPLIED SUSTAINABLE PLANNING AND DESIGN |
| CEVE 401 | CHEMISTRY FOR ENVIRONMENTAL ENGINEERING AND SCIENCE |
| CEVE 404 | ATMOSPHERIC PARTICULATE MATTER |
| CEVE 411 | ATMOSPHERIC CHEMISTRY AND CLIMATE |
| CEVE 412 | HYDROLOGY AND WATER RESOURCES ENGINEERING |
| CEVE 414 | COASTAL HAZARDS IN A CHANGING CLIMATE |
| CEVE 420 | ENVIRONMENTAL REMEDIATION RESTORATION |
| CEVE 421 | CLIMATE RISK MANAGEMENT |
| CEVE 434 | FATE AND TRANSPORT OF CONTAMINANTS IN THE ENVIRONMENT |
| CEVE 484 / STAT 484 | ENVIRONMENTAL RISK ASSESSMENT & HUMAN HEALTH |
| CHBE 382 | INNOVATION AND SUSTAINABILITY |
| CHEM 211 & CHEM 213 | ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY DISCUSSION I |
| ENST 250 | UNDERSTANDING ENERGY: ENERGY LITERACY AND CIVICS |
| ENST 281 / CHBE 281 | ENGINEERING SOLUTIONS FOR SUSTAINABLE COMMUNITIES |

| | | |
|---|---|--------------|
| ENST 307 / CEVE 307 / EEPS 307 | ENERGY AND THE ENVIRONMENT | |
| ENST 406 / CEVE 406 | INTRODUCTION TO ENVIRONMENTAL LAW | |
| Advanced Field or Research Experience Requirement | | |
| Independent Research (see the Opportunities tab for additional information). ⁶ | | |
| Select 1 course from the following: | | 3 |
| BIOS 310 | INDEPENDENT RESEARCH FOR BIOSCIENCES UNDERGRADUATES | |
| BIOS 401 | UNDERGRADUATE HONORS RESEARCH | |
| EEPS 390 | GEOLOGY FIELD CAMP | |
| EEPS 391 | PRACTICAL EXPERIENCE IN EARTH, ENVIRONMENTAL AND PLANETARY SCIENCE | |
| EEPS 481 | UNDERGRADUATE RESEARCH IN EARTH, ENVIRONMENTAL AND PLANETARY SCIENCES | |
| Capstone Senior Seminar Requirement | | |
| BIOS 495 / EEPS 495 | SEMINAR: TOPICS IN ENVIRONMENTAL SCIENCE | 3 |
| Total Credit Hours Required for the Major in Environmental Science | | 75-82 |
| Additional Credit Hours to Complete Degree Requirements [*] | | 7-13 |
| University Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/) [*] | | 31 |
| Total Credit Hours | | 120 |

Footnotes and Additional Information

^{*} **Note:** University Graduation Requirements include 31 credit hours, comprised of Distribution Requirements (Groups I, II, and III), FWIS, and LPAP coursework. In some instances, courses satisfying FWIS or distribution requirements may additionally meet other requirements, such as the Analyzing Diversity (AD) requirement, or some of the student's declared major, minor, or certificate requirements. Additional Credit Hours to Complete Degree Requirements include general electives, coursework completed as upper-level, residency (hours taken at Rice), and/or any other additional academic program requirements.

¹ STAT 180 may be substituted for STAT 280.

² The Core Courses acquaint students with a range of environmental topics encountered by scientists, engineers, managers, and policy makers. Core Courses stress the components of the global environment and their interactions, culminating with a tropical seminar that integrates across the field.

³ BIOS 204 *Environmental Sustainability: The Design & Practice of Community Agriculture* (1 credit hour) may only be applied once toward the Field Experience Requirement.

⁴ Students may also petition to complete alternative courses to be applied toward the Advanced Electives requirement.

⁵ In addition to the courses in the Natural Sciences and Engineering Advanced Electives list, students may complete 1 course listed in the major concentration requirements outside of the student's declared major concentration.

⁶ Students are encouraged, but not required, to undertake independent research on environmentally related topics.

Major Concentration: Ecology and Evolutionary Biology

Students must complete a total of 3 courses (9 credit hours) as listed below to satisfy the requirements for the major concentration in Ecology and Evolutionary Biology.

| Code | Title | Credit Hours |
|---|---|--------------|
| Core Requirements | | |
| Select 2 courses from the following: | | 6 |
| BIOS 271 | ENVIRONMENTAL MANAGEMENT | |
| BIOS 373 | CORAL REEF ECOSYSTEMS | |
| BIOS 374 | GLOBAL CHANGE BIOLOGY | |
| BIOS 423 | CONSERVATION BIOLOGY | |
| Elective Requirement | | |
| Select at least 1 course from the following: ¹ | | 3 |
| BIOS 321 | ANIMAL BEHAVIOR | |
| BIOS 326 | INSECT BIOLOGY | |
| BIOS 334 | EVOLUTION | |
| BIOS 336 | PLANT DIVERSITY | |
| BIOS 338 | ANALYSIS AND VISUALIZATION OF BIOLOGICAL DATA | |
| BIOS 373 | CORAL REEF ECOSYSTEMS | |
| BIOS 423 | CONSERVATION BIOLOGY | |
| BIOS 431 | EMERGING INFECTIOUS DISEASES | |
| EEPS 340 | GLOBAL BIOGEOCHEMICAL CYCLES | |
| Total Credit Hours | | 9 |

Footnotes and Additional Information

¹ Please note that the course not completed in the Core Requirements list for the major concentration in Ecology and Evolutionary Biology may be completed and applied towards the major concentration's Elective Requirement.

Policies for the BS Degree with a Major in Environmental Science and a Major Concentration in Ecology and Evolutionary Biology

Program Restrictions and Exclusions

Students pursuing the BS Degree with a Major in Environmental Science and a Major Concentration in Ecology and Evolutionary Biology should be aware of the following program restrictions:

- As noted in [Majors, Minors, and Certificates](https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/) (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/) under *Declaring Majors, Minors and Certificates*, students may not obtain both a BA and a BS in the same major. Students pursuing the BS Degree with a Major in Environmental Science and a Major Concentration in Ecology and Evolutionary Biology may not additionally pursue the BA Degree with a Major in Environmental Science.
- Students pursuing the major in Environmental Science may pursue only one major concentration within the major.

- Students pursuing the major in Environmental Sciences and a major concentration in Ecology and Evolutionary Biology may not additionally declare the minor in Ecology and Evolutionary Biology.

Transfer Credit

For Rice University's policy regarding transfer credit, see [Transfer Credit](https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/) (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/). Some departments and programs have additional restrictions on transfer credit. Requests for transfer credit must be approved for Rice equivalency by the designated transfer credit advisor for the appropriate academic department offering the Rice equivalent course (corresponding to the subject code of the course content). The Office of Academic Advising maintains the university's official list of [transfer credit advisors](https://oaa.rice.edu/advising-network/transfer-credit-advisors/) (https://oaa.rice.edu/advising-network/transfer-credit-advisors/) on their website: <https://oaa.rice.edu>. Students are encouraged to meet with the applicable transfer credit advisor as well as their academic program director when considering transfer credit possibilities.

Additional Information

For additional information, please see the following websites:

- <https://biosciences.rice.edu/>,
- <https://eeps.rice.edu/undergraduate/environmental-science-major/> (https://eeps.rice.edu/undergraduate/environmental-science-major/).

Opportunities for the BS Degree with a Major in Environmental Science and a Major Concentration in Ecology and Evolutionary Biology

Academic Honors

The university recognizes academic excellence achieved over an undergraduate's academic history at Rice. For information on university honors, please see [Latin Honors](https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (*summa cum laude*, *magna cum laude*, and *cum laude*) and [Distinction in Research and Creative Work](https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/). Some departments have department-specific Honors awards or designations.

Independent Research

Students are encouraged to undertake independent research on environmentally related topics as part of their degree programs, in cooperation with one or more faculty. Course options for independent research, repeatable for credit, include: BIOS 401, BIOS 402, and EEPS 481.

Students also can enroll in senior honors thesis programs within their major concentrations, or by arrangement with other departments, and/or through the Rice Undergraduate Scholars Program. Students completing a thesis will also be eligible for the [Distinction in Research and Creative Work](https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/), a university honor. Details for each program can be found here:

- BIOS Honors Research**

(<https://biosciences.rice.edu/research-overview> (<https://biosciences.rice.edu/research-overview/>))

- **EEPS Explore Research**

(<https://eeps.rice.edu/eeps.explore.research> (<https://eeps.rice.edu/eeps.explore.research/>))

- **EEPS Senior Honors Thesis**

(<https://eeps.rice.edu/eeps-honor-thesis> (<https://eeps.rice.edu/eeps-honor-thesis/>))

- **Rice Undergraduate Scholars Program**

(<https://ouri.rice.edu/rusp> (<https://ouri.rice.edu/rusp/>))

Additional Information

For additional information, please see the following websites:

- <https://biosciences.rice.edu/>,
- <https://eeps.rice.edu/undergraduate/environmental-science-major> (<https://eeps.rice.edu/undergraduate/environmental-science-major/>).