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 (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 25-29 courses (72-78 credit hours), depending on course selection, to satisfy major requirements.
- A minimum of 132-138 credit hours to satisfy degree requirements.
- A minimum of 60 credit hours outside of major 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 (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 (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. 3).

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).

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).) Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the Major in Environmental Science</td>
<td>72-78</td>
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<tr>
<td></td>
<td>Total Credit Hours Required for the BS Degree with a Major in Environmental Science</td>
<td>132-138</td>
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Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td>Core Requirements</td>
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<tr>
<td></td>
<td>Foundation Coursework</td>
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</tr>
<tr>
<td>BIOC 201</td>
<td>INTRODUCTORY BIOLOGY</td>
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<tr>
<td>EBIO 202</td>
<td>INTRODUCTORY BIOLOGY II</td>
<td>3</td>
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<tr>
<td>CHEM 121</td>
<td>GENERAL CHEMISTRY I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>or CHEM 111 AP/OTH CREDIT IN GENERAL CHEMISTRY I</td>
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<tr>
<td>CHEM 123</td>
<td>GENERAL CHEMISTRY LABORATORY I</td>
<td>1</td>
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<tr>
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<td>or CHEM 113 AP/OTH CREDIT IN GENERAL CHEMISTRY LAB I</td>
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<td>CHEM 122</td>
<td>GENERAL CHEMISTRY II</td>
<td>3</td>
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<tr>
<td></td>
<td>or CHEM 112 AP/OTH CREDIT IN GENERAL CHEMISTRY II</td>
<td></td>
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<tr>
<td>CHEM 124</td>
<td>GENERAL CHEMISTRY LABORATORY II</td>
<td>1</td>
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<tr>
<td></td>
<td>or CHEM 114 AP/OTH CREDIT IN GENERAL CHEMISTRY LAB II</td>
<td></td>
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<tr>
<td>MATH 101</td>
<td>SINGLE VARIABLE CALCULUS I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>or MATH 105 AP/OTH CREDIT IN CALCULUS I</td>
<td></td>
</tr>
<tr>
<td>MATH 102</td>
<td>SINGLE VARIABLE CALCULUS II</td>
<td>3</td>
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<td></td>
<td>or MATH 106 AP/OTH CREDIT IN CALCULUS II</td>
<td></td>
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<tr>
<td>STAT 280</td>
<td>ELEMENTARY APPLIED STATISTICS</td>
<td>4</td>
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<tr>
<td></td>
<td>or STAT 305 INTRODUCTION TO STATISTICS FOR BIOSCIENCES</td>
<td></td>
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<tr>
<td></td>
<td>Select 1 course from the following:</td>
<td>4</td>
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<tr>
<td>PHYS 101</td>
<td>MECHANICS (WITH LAB)</td>
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<tr>
<td>&amp; PHYS 103</td>
<td>and MECHANICS DISCUSSION</td>
<td></td>
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<tr>
<td>PHYS 111</td>
<td>HONORS MECHANICS (WITH LAB)</td>
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</tbody>
</table>
Bachelor of Science (BS) Degree with a Major in Environmental Science and a Major Concentration in Ecology and Evolutionary Biology

PHYS 125  GENERAL PHYSICS (WITH LAB)  
Select 1 course from the following: 4  
PHYS 102  ELECTRICITY & MAGNETISM (WITH LAB)  
and ELECTRICITY AND MAGNETISM DISCUSSION  
PHYS 112  HONORS ELECTRICITY & MAGNETISM (WITH LAB)  
PHYS 126  GENERAL PHYSICS II (WITH LAB)  

PHYS 102  & PHYS 104  ELECTRICITY & MAGNETISM (WITH LAB)  
and ELECTRICITY AND MAGNETISM DISCUSSION  

Core Courses 2  
ENST 100 / ARCH 105  ENVIRONMENT, CULTURE AND SOCIETY 3  
ESCI 115  INTRODUCTION TO THE EARTH 3 or 4  
or ESCI 110  THE EARTH SYSTEM, ENVIRONMENT, AND SOCIETY  

Select 1 course from the following: 3  
ESCI 107  OCEANS AND GLOBAL CHANGE  
ESCI 109  OCEANOGRAPHY  
ESCI 201 / ENST 201  THE SCIENCE OF CLIMATE CHANGE  

EBIO 213  INTRO EXPERIMENTAL ECOLOGY AND EVOLUTIONARY BIOLOGY 2  
EBIO 325  ECOLOGY 3  

Field Experience  
Select 1-2 courses from the following: 2-3  
EBIO 306  INDEPENDENT RESEARCH FOR ECOLOGY & EVOLUTIONARY BIOLOGY UNDERGRADUATES  
EBIO 316  LAB MODULE IN ECOLOGY  
EBIO 317  LAB MODULE IN BEHAVIOR  
EBIO 319  TROPICAL FIELD BIOLOGY  
EBIO 320  ECOLOGY AND CONSERVATION OF BRAZILIAN WETLANDS LABORATORY  
EBIO 324  CONSERVATION BIOLOGY LAB  
EBIO 327  BIOLOGICAL DIVERSITY  
EBIO 330  INSECT BIOLOGY LAB  
EBIO 337  FIELD BIRD BIOLOGY LAB  
ENST 379 / EBIO 379  LAB MODULE IN AQUATIC ECOLOGY WITH SCUBA  
ESCI 103  FIELD TRIPS FOR THE ENVIRONMENT  
ESCI 334  GEOLOGICAL TECHNIQUES  
ESCI 380 / FOTO 390  VISUALIZING NATURE  
FWIS 187  EXPLORING THE SCIENCE AND HISTORY OF HOUSTON’S BAYOUS  

Major Concentration  
Select 1 from the following Major Concentrations (see below for Major Concentration requirements): 9-12  
Earth Science  
Ecology and Evolutionary Biology  

Advanced Electives 3  
Select 1 course from the following: 3  
ANTH 348  ANTHROPOLOGIES OF NATURE  
ANTH 381  MEDICAL ANTHROPOLOGY  

Select 1 course from the following:  
ENST 302 / SOCI 304  ENVIRONMENTAL ISSUES: RICE INTO THE FUTURE  
ENST 332 / ANTH 332  THE SOCIAL LIFE OF CLEAN ENERGY  
ENST 367 / SOCI 367  ENVIRONMENTAL SOCIOLOGY  
ENST 437 / ECON 437  ENERGY ECONOMICS  
ENST 480 / ECON 480  ENVIRONMENTAL AND ENERGY ECONOMICS  
ENST 332 / ARCH 322  CASE STUDIES IN SUSTAINABILITY: THE REGENERATIVE REPOSITIONING OF NEW OR EXISTING RICE CAMPUSS BLDGS  
ENST 368 / ENGL 368  LITERATURE AND THE ENVIRONMENT  
HIST 425  20TH CENTURY AMERICAN CONSERVATION MOVEMENT  

Natural Sciences and Engineering 4  
Select 1 course from the following: 3-4  
CEVE 302 / ENGI 302  SUSTAINABLE DESIGN  
CEVE 308  INTRODUCTION TO AIR POLLUTION CONTROL  
CEVE 401  CHEMISTRY FOR ENVIRONMENTAL ENGINEERING AND SCIENCE LAB  
CEVE 404  ATMOSPHERIC PARTICULATE MATTER  
CEVE 411  ATMOSPHERIC PROCESSES  
CEVE 412  HYDROLOGY AND WATER RESOURCES ENGINEERING  
CEVE 420  ENVIRONMENTAL REMEDIATION RESTORATION  
CEVE 434  FATE AND TRANSPORT OF CONTAMINANTS IN THE ENVIRONMENT  
CEVE 484 / STAT 484  ENVIRONMENTAL RISK ASSESSMENT & HUMAN HEALTH  
CHEM 211 / & CHEM 213  ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY DISCUSSION  
ENST 281 / CHBE 281  ENGINEERING SOLUTIONS FOR SUSTAINABLE COMMUNITIES  
ENST 307 / CEVE 307 / ESCI 307  ENERGY AND THE ENVIRONMENT
### Footnotes and Additional Information

1. Includes coursework completed as distribution credit, FWIS, LPAP upper-level, residency (hours taken at Rice), 60 hours outside of the major (if applicable), and any additional academic program requirements. The "hours outside of the major" requirement may include all of the above university requirements.

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

4. 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.

5. 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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ENST 406 / CEVE 406</td>
<td>INTRODUCTION TO ENVIRONMENTAL LAW</td>
<td></td>
</tr>
<tr>
<td>EBI 403</td>
<td>UNDERGRADUATE HONORS RESEARCH IN ECOLOGY AND EVOLUTIONARY BIOLOGY</td>
<td></td>
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<tr>
<td>or EBI 404</td>
<td>UNDERGRADUATE HONORS RESEARCH IN ECOLOGY AND EVOLUTIONARY BIOLOGY</td>
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</tr>
<tr>
<td>ESCI 390</td>
<td>GEOLOGY FIELD CAMP</td>
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<tr>
<td>ESCI 391</td>
<td>EARTH SCIENCE FIELD EXPERIENCE</td>
<td></td>
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<tr>
<td>ESCI 481</td>
<td>UNDERGRADUATE RESEARCH IN EARTH SCIENCE</td>
<td></td>
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<tr>
<td>EBI 495</td>
<td>SEMINAR: TOPICS IN ENVIRONMENTAL SCIENCE</td>
<td>3</td>
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</table>

**Total Credit Hours Required for the Major in Environmental Science**

- University Graduation Requirements (ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements)

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>EBI 270</td>
<td>ECOSYSTEM MANAGEMENT</td>
<td>6</td>
</tr>
<tr>
<td>EBI 323</td>
<td>CONSERVATION BIOLOGY</td>
<td></td>
</tr>
<tr>
<td>EBI 327</td>
<td>CORAL REEF ECOSYSTEMS</td>
<td></td>
</tr>
<tr>
<td>EBI 372</td>
<td>ANIMAL BEHAVIOR</td>
<td></td>
</tr>
</tbody>
</table>

**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

#### Transfer Credit

For Rice University’s policy regarding transfer credit, see Transfer Credit (ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit). Some departments and programs have additional restrictions on transfer credit. The Office of Academic Advising maintains the university’s official list of transfer credit advisors on their website: https://oaa.rice.edu. Students are encouraged to meet with their academic program’s transfer credit advisor when considering transfer credit possibilities.

#### Program Transfer Credit Guidelines

Students pursuing the major in Environmental Science should be aware of the following program transfer credit guidelines:

- Requests for transfer credit will be considered by the program director (and/or the program’s official transfer credit advisor) on an individual case-by-case basis.

### Additional Information

For additional information, please see the following websites:
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 ([ga.rice.edu/undergraduate-students/honors-distinctions/university](ga.rice.edu/undergraduate-students/honors-distinctions/university)) (summa cum laude, magna cum laude, and cum laude) and Distinction in Research and Creative Work ([ga.rice.edu/undergraduate-students/honors-distinctions/university](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: EBIO 403, EBIO 404, and ESCI 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, a university honor. Details for each program can be found here:

- Rice Undergraduate Scholars Program ([https://ouri.rice.edu/rice-undergraduate-scholars-program-rusp-1](https://ouri.rice.edu/rice-undergraduate-scholars-program-rusp-1))

Additional Information
For additional information, please see the following websites:

- [https://biosciences.rice.edu/](https://biosciences.rice.edu/)
- [https://earthscience.rice.edu/academics/undergraduate-program/](https://earthscience.rice.edu/academics/undergraduate-program/)