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/)
  - 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/officialcertifiers)). 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>
</tr>
<tr>
<td></td>
<td>Total Credit Hours Required for the BS Degree with a Major in Environmental Science</td>
<td>132-138</td>
</tr>
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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><strong>Core Requirements</strong></td>
<td></td>
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<tr>
<td></td>
<td><strong>Foundation Coursework</strong></td>
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</tr>
<tr>
<td>BIOC 201</td>
<td>INTRODUCTORY BIOLOGY</td>
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</tr>
<tr>
<td>EBIO 202</td>
<td>INTRODUCTORY BIOLOGY II</td>
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</tr>
<tr>
<td>CHEM 121</td>
<td>GENERAL CHEMISTRY I</td>
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<tr>
<td>or CHEM 111</td>
<td>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>
</tr>
<tr>
<td>or CHEM 113</td>
<td>AP/OTH CREDIT IN GENERAL CHEMISTRY LAB I</td>
<td></td>
</tr>
<tr>
<td>CHEM 122</td>
<td>GENERAL CHEMISTRY II</td>
<td>3</td>
</tr>
<tr>
<td>or CHEM 112</td>
<td>AP/OTH CREDIT IN GENERAL CHEMISTRY II</td>
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<tr>
<td>CHEM 124</td>
<td>GENERAL CHEMISTRY LABORATORY II</td>
<td>1</td>
</tr>
<tr>
<td>or CHEM 114</td>
<td>AP/OTH CREDIT IN GENERAL CHEMISTRY LAB II</td>
<td></td>
</tr>
<tr>
<td>MATH 101</td>
<td>SINGLE VARIABLE CALCULUS I</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 105</td>
<td>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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<tr>
<td>or MATH 106</td>
<td>AP/OTH CREDIT IN CALCULUS II</td>
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</tr>
<tr>
<td>STAT 280</td>
<td>ELEMENTARY APPLIED STATISTICS</td>
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</tr>
<tr>
<td>or STAT 305</td>
<td>INTRODUCTION TO STATISTICS FOR BIOSCIENCES</td>
<td></td>
</tr>
<tr>
<td>MATH 101</td>
<td>MECHANICS WITH LAB</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 103</td>
<td>MECHANICS DISCUSSION</td>
<td></td>
</tr>
<tr>
<td>PHYS 111</td>
<td>HONORS MECHANICS WITH LAB</td>
<td></td>
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</tbody>
</table>

Select 1 course from the following:

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<tr>
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<td>MECHANICS WITH LAB</td>
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<td>MECHANICS DISCUSSION</td>
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</table>
Bachelor of Science (BS) Degree with a Major in Environmental Science and a Major Concentration in Ecology and Evolutionary Biology

**General Physics (with Lab)**

Select 1 course from the following:

- PHYS 102: Electromagnetism (with Lab)
- PHYS 104: Electricity and Magnetism Discussion
- PHYS 112: Honors Electromagnetism (with Lab)
- PHYS 126: General Physics II (with Lab)

**Core Courses**

- ENST 100 / ARCH 105: Environment, Culture, and Society
- ESCI 115: Introduction to the Earth

Select 1 course from the following:

- ESCI 107: Oceans and Global Change
- ESCI 109: Oceanography
- ESCI 201 / ENST 201: The Science of Climate Change

**Field Experience**

Select 1-2 courses from the following:

- EBI 306: Independent Research for Ecology and Evolutionary Biology Undergraduates
- EBI 316: Lab Module in Ecology
- EBI 317: Lab Module in Behavior
- EBI 319: Tropical Field Biology
- EBI 320: Ecology and Conservation of Brazilian Wetlands Laboratory
- EBI 324: Conservation Biology Lab
- EBI 327: Biological Diversity
- EBI 330: Insect Biology Lab
- EBI 337: Field Bird Biology Lab
- ENST 379 / EBI 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):

- Earth Science
- Ecology and Evolutionary Biology

**Advanced Electives**

Select 1 course from the following:

- ANTH 348: Anthropologies of Nature
- ANTH 381: Medical Anthropology
- 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: Energy Sociology
- ENST 480 / ECON 480: Environmental and Energy Economics
- POLI 332: Urban Politics
- POLI 362: Comparative Urban Politics and Policy
- SOCI 313: Demography
- SOCI 423: Sociology of Food

**Humanities and Architecture**

Select 1 from the following:

- ENGL 358: Consumption and Consumerism
- ENGL 459: Studies in Literature and Ecology
- ENST 313 / ARCH 313: Sustainable Design
- ENST 322 / ARCH 322: Case Studies in Sustainability: The Regenerative Repositioning of New or Existing Rice Campus Buildings
- ENST 368 / ENGL 368: Literature and the Environment
- HIST 425: 20th Century American Conservation Movement

**Natural Sciences and Engineering**

Select 1 from the following:

- 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: Organic Chemistry I
- CHEM 213: Organic Chemistry Discussion
- CHEM 281 / CHBE 281: Engineering Solutions for Sustainable Communities
Bachelor of Science (BS) Degree with a Major in Environmental Science and a Major Concentration in Ecology and Evolutionary Biology

**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</td>
<td>INTRODUCTION TO ENVIRONMENTAL LAW</td>
<td></td>
</tr>
<tr>
<td>CEVE 406</td>
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<td></td>
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</tbody>
</table>

**Advanced Field or Research Experience Requirement**

Independent Research (see the Opportunities tab for additional information).^5^ Select 1 course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBlO 403</td>
<td>UNDERGRADUATE HONORS RESEARCH IN ECOLOGY AND EVOLUTIONARY BIOLOGY</td>
<td></td>
</tr>
<tr>
<td>or EBlO 404</td>
<td>UNDERGRADUATE HONORS RESEARCH IN ECOLOGY AND EVOLUTIONARY BIOLOGY</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESlC 390</td>
<td>GEOLoGY FIELD CAMP</td>
<td></td>
</tr>
<tr>
<td>ESlC 391</td>
<td>EARTH SCIENCE FIELD EXPERIENCE</td>
<td></td>
</tr>
<tr>
<td>ESlC 481</td>
<td>UNDERGRADUATE RESEARCH IN EARTH SCIENCE</td>
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</table>

**Capstone Senior Seminar Requirement**

Select at least 1 course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ESlC 495</td>
<td>SEMINAR: TOPICS IN ENVIRONMENTAL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>EBlO 495</td>
<td>SCIENCE</td>
<td></td>
</tr>
</tbody>
</table>

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

Total Credit Hours: 132-138

**University Graduation Requirements**

- 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.
- CHEM 151 may be substituted for CHEM 121 or CHEM 111;
- CHEM 153 may be substituted for CHEM 123 or CHEM 113;
- CHEM 152 may be substituted for CHEM 122 or CHEM 112, and
- CHEM 154 may be substituted for CHEM 124 or CHEM 114.

**Publications and Additional Information**

- 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.
- Students may also petition to complete alternative courses to be applied toward the Advanced Electives requirement.
- 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.
- Students are encouraged, but not required, to undertake independent research on environmentally related topics.

**Elective Requirement**

Select at least 1 course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBlO 323</td>
<td>CONSERVATION BIOLOGY</td>
<td></td>
</tr>
<tr>
<td>ENST 323</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBlO 372</td>
<td>CORAL REEF ECOSYSTEMS</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) (summa cum laude, magna cum laude, and cum laude) and Distinction in Research and Creative Work (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:

- EBIO Honors Research
- ESCI Senior Honors Thesis
  (https://earthscience.rice.edu/academics/undergraduate-program/honors-thesis)
- Rice Undergraduate Scholars Program
  (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://earthscience.rice.edu/academics/undergraduate-program/