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

Program Learning Outcomes for the BS Degree with a Major in Ecology and Evolutionary Biology

Upon completing the BS degree with a major in Ecology and Evolutionary Biology, students will be able to:

1. Locate primary scientific literature and demonstrate the ability to apply critical thinking and problem solving skills to evaluate published and proposed research in the biological sciences and to apply these skills to develop an independent research project.

2. Demonstrate the ability to apply the modern scientific method, including designing experiments and/or building mathematical models, collecting, analyzing, and interpreting data using common statistical methods and software programs.

3. Demonstrate effective oral and written communication skills, including an ability to communicate effectively and work with diverse groups and the ability to interpret and communicate the results of original research.

4. Demonstrate familiarity with the diversity of life and an in-depth understanding of at least one level or biological organization (i.e. genetic, genomic, cellular, organismal, population, community, or ecosystem).

5. Demonstrate a comprehensive knowledge of biology and an in-depth understanding of ecology and evolutionary biology.

6. Demonstrate understanding of the practice and culture of science, scientific ethics, and the relationship between science and society.

Requirements for the BS Degree with a Major in Ecology and Evolutionary Biology

For general university requirements, see Graduation Requirements (ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements). Students pursuing the BS degree with a major in Ecology and Evolutionary Biology must complete:

- A minimum of 22 courses (61 credit hours) to satisfy major requirements. Additional credit hours may be required depending on course selection.
- A minimum of 121 credit hours to satisfy degree requirements. Additional credit hours may be required depending on course selection.
- A minimum of 60 credit hours outside of major requirements.
- A minimum of 13 courses (43 credit hours) at the 300-level or above.

The Ecology and Evolutionary Biology major is intended for students pursuing a wide range of careers in the life sciences. Course work emphasizes a broad understanding of basic biology together with in-depth knowledge of ecology and evolutionary biology that culminates in a required capstone 400-level course incorporating primary scientific literature, presentations, and writing in an advanced topic. The BS program is well suited for students planning to go on to graduate or professional school, or who will enter the workforce with the BS as their terminal degree. Students pursuing the BS degree are also required to conduct independent research under the supervision or co-supervision of an Ecology and Evolutionary Biology faculty member (though the research can take place in other locations or institutions such as the Texas Medical Center or at field sites throughout the world). Students are strongly encouraged to take advantage of study abroad opportunities.

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

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<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 Ecology and Evolutionary Biology</td>
<td>Minimum of 61</td>
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<tr>
<td></td>
<td>Total Credit Hours Required for the BS Degree with Major in Ecology and Evolutionary Biology</td>
<td>Minimum of 121</td>
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### Degree Requirements

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<tr>
<th>Code</th>
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<th>Credit Hours</th>
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#### Core Requirements

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<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>
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</tr>
<tr>
<td>or MATH 106</td>
<td>AP/OTH CREDIT CALCULUS II</td>
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</table>

<table>
<thead>
<tr>
<th>Select 1 course from the following:</th>
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<tbody>
<tr>
<td>EBIO 338</td>
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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CHEM 121 &amp; CHEM 123</td>
<td>GENERAL CHEMISTRY I and GENERAL CHEMISTRY LABORATORY I</td>
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<tr>
<td>PHYS 125</td>
<td>GENERAL PHYSICS (WITH LAB)</td>
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#### Biology Lecture Courses

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<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>
</tr>
<tr>
<td>EBIO 325</td>
<td>ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>EBIO 334 / BIOC 334</td>
<td>EVOLUTION</td>
<td>3</td>
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#### Biology Laboratory Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BIOC 211</td>
<td>INTERMEDIATE EXPERIMENTAL BIOSCIENCES</td>
<td>2</td>
</tr>
<tr>
<td>EBIO 213</td>
<td>INTRO EXPERIMENTAL ECOLOGY AND EVOLUTIONARY BIOLOGY</td>
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#### Scientific Communication Course

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>EBIO 412</td>
<td>ADVANCED COMMUNICATION IN THE BIOLOGICAL SCIENCES</td>
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#### Independent Research Courses

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>
EBIO 306 INDEPENDENT RESEARCH FOR ECOLOGY & EVOLUTIONARY BIOLOGY UNDERGRADUATES (at least 2 credit hours) 2

EBIO 403 UNDERGRADUATE HONORS RESEARCH IN ECOLOGY AND EVOLUTIONARY BIOLOGY 5

EBIO 404 UNDERGRADUATE HONORS RESEARCH IN ECOLOGY AND EVOLUTIONARY BIOLOGY 5

Elective Requirements
Lecture in Ecology and Evolutionary Biology
Select 2 courses from the following: 6

EBIO 321 ANIMAL BEHAVIOR
EBIO 323 / CONSERVATION BIOLOGY
ENST 323
EBIO 326 INSECT BIOLOGY
EBIO 328 EVOLUTION OF GENES & GENOMES
EBIO 329 / BIOC 329
EBIO 331 / BIOC 331
EBIO 333 / COMP 370
EBIO 336 PLANT DIVERSITY
EBIO 340 / ENST 340 / ESCI 340
EBIO 365 INTRODUCTORY PHYCOLOGY
EBIO 366 APPLIED PHYCOLOGY
EBIO 372 CORAL REEF ECOSYSTEMS
EBIO 391 TRANSFER CREDIT IN ECOLOGY AND EVOLUTIONARY BIOLOGY
EBIO 433 ADVANCED ECOLOGY

Lecture in Biochemistry and Cell Biology
Select 1 course from the following: 1-2

BIOC 300 PARADIGMS IN BIOCHEMISTRY AND CELL BIOLOGY
BIOC 301 BIOCHEMISTRY I
BIOC 302 BIOCHEMISTRY II
BIOC 332 / BIOE 302
BIOC 335 CELLULAR AND MOLECULAR ANIMAL PHYSIOLOGY
BIOC 341 CELL BIOLOGY
BIOC 344 MOLECULAR BIOLOGY AND GENETICS
BIOC 352 PHYSICAL CHEMISTRY FOR THE BIOSCIENCES
BIOC 361 / BIOE 361 / GLHT 361
BIOC 368 / HUMA 368 CONCEIVING AND MISCONCEIVING THE MONSTROS IN FICTION AND IN ART, IN MEDICINE AND IN BIOSCIENCE
BIOC 371 SEMINAR IN CONTEMPORARY BIOLOGICAL AND BIOMEDICAL RESEARCH
BIOC 372 IMMUNOLOGY

BIOC 380 / NEUR 380 / PSYC 380 FUNDAMENTAL NEUROSCIENCE SYSTEMS
BIOC 385 / NEUR 385 MOLECULAR NEUROSCIENCE
BIOC 390 TRANSFER CREDIT IN BIOCHEMISTRY AND CELL BIOLOGY
BIOC 424 MICROBIOLOGY AND BIOTECHNOLOGY
BIOC 425 PLANT MOLECULAR GENETICS AND DEVELOPMENT
BIOC 443 ADVANCED CONCEPTS AND CRITICAL ANALYSIS IN MODERN DEVELOPMENTAL BIOLOGY
BIOC 445 ADVANCED MOLECULAR BIOLOGY AND GENETICS
BIOC 447 EXPERIMENTAL BIOLOGY AND THE FUTURE OF MEDICINE
BIOC 450 VIRUSES AND INFECTIOUS DISEASES
BIOC 460 CANCER BIOLOGY
BIOC 470 COMPUTATION WITH BIOLOGICAL DATA
BIOC 481 MOLECULAR BIOPHYSICS I
BIOC 482 STRUCTURAL BIOLOGY

EBIO Laboratory Course Requirement
Select 1 course from the following: 1-2

EBIO 316 LAB MODULE IN ECOLOGY
EBIO 317 LAB MODULE IN BEHAVIOR
EBIO 319 TROPICAL FIELD BIOLOGY
EBIO 320 ECOSYSTEMS AND CONSERVATION OF BRAZILIAN WETLANDS LABORATORY
EBIO 324 CONSERVATION BIOLOGY LAB
EBIO 327 BIOLOGICAL DIVERSITY
EBIO 330 INSECT BIOLOGY LAB
EBIO 332 EVOLUTION OF GENES & GENOMES LAB
EBIO 335 EVOLUTIONARY BIOINFORMATICS LAB
EBIO 337 FIELD BIRD BIOLOGY LAB
EBIO 367 INTRODUCTION PHYCOLOGY LAB
EBIO 368 APPLIED PHYCOLOGY LAB
EBIO 379 / ENST 379 LAB MODULE IN AQUATIC ECOLOGY WITH SCUBA
EBIO 393 LABORATORY TRANSFER CREDIT IN BIOSCIENCES

BIOC Laboratory Course Requirement
Select 1 course from the following or complete an additional laboratory course from the EBIO Laboratory requirement: 1-2

BIOC 311 ADVANCED EXPERIMENTAL BIOSCIENCES
BIOC 313 INTRODUCTORY SYNTHETIC BIOLOGY
BIOC 318 MICROBIOLOGY LABORATORY
BIOC 320 / BIOE 342 LABORATORY IN TISSUE CULTURE
BIOC 333 BIONNOVATION STUDIO: FROM BASIC RESEARCH AND IDEATION TO TECHNOLOGY DEVELOPMENT
BIOC 413 EXPERIMENTAL MOLECULAR BIOLOGY
BIOC 415 EXPERIMENTAL PHYSIOLOGY

Natural Sciences or Engineering
Bachelor of Science (BS) Degree with a Major in Ecology and Evolutionary Biology

Select 1 course offered by the School of Natural Sciences or the School of Engineering at the 300-level or above 2

| Total Credit Hours Required for the Major in Ecology and Evolutionary Biology | Minimum of 61 |
| University Graduation Requirements [ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements]  2 | 60 |
| Total Credit Hours | Minimum of 121 |

Footnotes and Additional Information
* Includes coursework completed as distribution credit, FWIS, LPAR, 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.

1 Permissible substitutions: BIOC 212 may be substituted for BIOC 211; MATH 111 and MATH 112 may be substituted for MATH 101 or MATH 105; CHEM 151 and CHEM 153 may be substituted for CHEM 121 and CHEM 123; PHYS 101 and PHYS 103 or PHYS 111 may be substituted for PHYS 125.

2 The elective course in Natural Sciences or Engineering must be taken for at least 3 credit hours. Courses offered by the School of Natural Sciences and the School of Engineering include the following subject codes: ASTR, BIOC, CAAM, CEVE, CHBE, CHEM, COMP, ELEC, ENGI, ENST, ESCI, GLHT, HEAL, KINE, MATH, MECH, MSNE, NSCI, PHYS, and STAT.

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

Advising
Rice University policies are governed primarily by the General Announcements; students are encouraged to look there first for academic policies. Advising information specific to the Department of BioSciences can be found at the department website by clicking on the tab for Undergraduate Studies: [http://biosciences.rice.edu/](http://biosciences.rice.edu/).

Program Restrictions and Exclusions
Students pursuing the major in Ecology and Evolutionary Biology should be aware of the following program restrictions:

- Students pursuing the major in Ecology and Evolutionary Biology may not additionally declare the major in Biological Sciences.

Transfer Credit
For Rice University's policy regarding transfer credit, see Transfer Credit ([ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit](http://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](https://oaa.rice.edu). Students are encouraged to meet with their academic program's transfer credit advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines
Students pursuing the major in Ecology and Evolutionary Biology should be aware of the following departmental 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 BioSciences website: [http://biosciences.rice.edu/](http://biosciences.rice.edu/).

Opportunities for the BS Degree with a Major 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](http://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](http://ga.rice.edu/undergraduate-students/honors-distinctions/university)). Some departments have department-specific Honors awards or designations.

Departmental Honors
Instructions on applying for the Distinction in Research and Creative Work award from the Department of BioSciences can be found at the department website, by clicking on the link for Undergraduate Studies, at: [http://biosciences.rice.edu/](http://biosciences.rice.edu/).

Research in the BioSciences
Research is highly encouraged for all biosciences majors, and there are many opportunities for independent research at Rice. Information about research for credit and research internships specific to the Department of BioSciences can be found at the department website, by clicking on the link for Undergraduate Studies, at: [http://biosciences.rice.edu/](http://biosciences.rice.edu/).

Additional Information
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