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

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

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

1. Demonstrate a broad knowledge of core concepts in biology.
2. Demonstrate an advanced understanding of ecology and evolutionary biology.
3. Demonstrate the ability to access scientific literature in the biological sciences and to use critical thinking skills to evaluate primary and secondary sources of biological research.
4. Demonstrate the ability to apply the process of science through original research, including designing experiments and/or building mathematical models, and collecting, analyzing, and interpreting data.
5. Demonstrate effective oral, written, and visual communication skills, including communicating science to diverse audiences.

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

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

- A minimum of 69 credit hours to satisfy major requirements.
- A minimum of 120 credit hours to satisfy degree requirements.
- A minimum of 44 credit hours taken at the 300-level or above.
- Core courses common to all major concentrations.
- The requirements for the major concentration in Biochemistry. When students declare the major (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/#text) in Biosciences, students must additionally identify and declare one of the four major concentrations, either in:
  - Biochemistry (https://ga.rice.edu/programs-study/departments-programs/natural-sciences/biosciences/biochemistry-bs/#requirementstext), or
  - Cell Biology and Genetics (https://ga.rice.edu/programs-study/departments-programs/natural-sciences/biosciences/cell-biology-and-genetics-bs/#requirementstext), or
  - Ecology and Evolutionary Biology (p. 1), or

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).

The BS degree emphasizes broad foundational knowledge of biology with in-depth exposure to the subfield of ecology and evolutionary biology that includes independent research.

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 Biosciences and a Major Concentration in Ecology and Evolutionary Biology</td>
<td>Minimum of 69</td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours Required for the BS Degree with a Major in Biosciences and a Major Concentration in Ecology and Evolutionary Biology</td>
<td>120</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>Core Lecture Courses</td>
<td></td>
</tr>
<tr>
<td>CHEM 121</td>
<td>GENERAL CHEMISTRY I or CHEM 111</td>
<td>AP/OTH CREDIT IN GENERAL CHEMISTRY I</td>
</tr>
<tr>
<td>CHEM 123</td>
<td>GENERAL CHEMISTRY LABORATORY I or CHEM 113</td>
<td>AP/OTH CREDIT IN GENERAL CHEMISTRY LAB I</td>
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<tr>
<td>MATH 101</td>
<td>SINGLE VARIABLE CALCULUS I or MATH 105</td>
<td>AP/OTH CREDIT IN CALCULUS I</td>
</tr>
<tr>
<td>MATH 102</td>
<td>SINGLE VARIABLE CALCULUS II or MATH 106</td>
<td>AP/OTH CREDIT IN CALCULUS II</td>
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<td>PHYS 125</td>
<td>GENERAL PHYSICS (WITH LAB)</td>
<td>4</td>
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<tr>
<td>STAT 305</td>
<td>INTRODUCTION TO STATISTICS FOR BIOSCIENCES</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Elective Lecture Course</td>
<td></td>
</tr>
<tr>
<td>BIOS 201</td>
<td>INTRODUCTORY BIOLOGY I</td>
<td>3</td>
</tr>
<tr>
<td>BIOS 202</td>
<td>INTRODUCTORY BIOLOGY II</td>
<td>3</td>
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</table>

Select 1 elective course from lecture courses offered by the Wiess School of Natural Sciences or the George R. Brown School of Engineering at the 200-level or above.
### Bachelor of Science (BS) Degree with a Major in Biosciences and a Major Concentration in Ecology and Evolutionary Biology

**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>BIOS 332</td>
<td>ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BIOS 334</td>
<td>EVOLUTION</td>
<td>3</td>
</tr>
<tr>
<td>BIOS 338</td>
<td>ANALYSIS AND VISUALIZATION OF BIOLOGICAL DATA</td>
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</tr>
</tbody>
</table>

**Core Lecture Courses**

- BIOS 312 ADVANCED COMMUNICATION IN THE BIOLOGICAL SCIENCES (2 credit hours)
- BIOS 332 ECOLOGY (3 credit hours)
- BIOS 334 EVOLUTION (3 credit hours)

**Elective Lecture Courses in Ecology and Evolutionary Biology**

Select 3 courses from the following:

- BIOS 321 ANIMAL BEHAVIOR
- BIOS 326 INSECT BIOLOGY
- BIOS 329 ANIMAL DIVERSITY
- BIOS 336 PLANT DIVERSITY
- BIOS 373 CORAL REEF ECOSYSTEMS
- BIOS 391 TRANSFER CREDIT IN ECOLOGY AND EVOLUTIONARY BIOLOGY
- BIOS 423 CONSERVATION BIOLOGY
- BIOS 431 BIOLOGY OF INFECTIOUS DISEASES

**Elective Lecture Courses in Biochemistry and Cell Biology**

Select 2 courses from the following (or select 2 additional courses (6 credit hours) from the Elective Lecture Courses in Ecology and Evolutionary Biology, see course list above)

- BIOE 464 EXTRACELLULAR MATRIX
- BIOS 300 PARADIGMS IN BIOCHEMISTRY AND CELL BIOLOGY
- BIOS 301 BIOCHEMISTRY I
- BIOS 302 BIOCHEMISTRY II
- BIOS 340 INTEGRATIVE ANIMAL PHYSIOLOGY
- BIOS 341 CELL BIOLOGY
- BIOS 344 MOLECULAR BIOLOGY AND GENETICS
- BIOS 352 PHYSICAL CHEMISTRY FOR THE BIOSCIENCES
- BIOS 368 CONCEIVING AND MISCONCEIVING THE MONSTROUS IN FICTION AND IN ART, IN MEDICINE AND IN BIOSCIENCE
- BIOS 372 IMMUNOLOGY
- BIOS 385 FUNDAMENTALS OF CELLULAR AND MOLECULAR NEUROSCIENCE
- BIOS 390 TRANSFER CREDIT IN BIOCHEMISTRY AND CELL BIOLOGY
- BIOS 410 STEM CELL BIOLOGY
- BIOS 424 MICROBIOLOGY AND BIOTECHNOLOGY
- BIOS 425 PLANT MOLECULAR GENETICS AND DEVELOPMENT
- BIOS 442 MOLECULES, MEMORY AND MODEL ANIMALS: METHODS IN BEHAVIORAL NEUROSCIENCE
- BIOS 443 DEVELOPMENTAL NEUROBIOLOGY
- BIOS 447 EXPERIMENTAL BIOLOGY AND THE FUTURE OF MEDICINE
- BIOS 449 ADVANCED CELL AND MOLECULAR NEUROSCIENCE
- BIOS 450 VIRUSES AND INFECTIOUS DISEASES
- BIOS 460 CANCER BIOLOGY
- BIOS 470 COMPUTATION WITH BIOLOGICAL DATA
- BIOS 481 MOLECULAR BIOPHYSICS I
- BIOS 482 STRUCTURAL BIOLOGY
- NEUR 380 / PSYC 380 FUNDAMENTAL NEUROSCIENCE SYSTEMS

**Core Laboratory Course**

- BIOS 213 INTRODUCTORY LAB IN ECOLOGY & EVOLUTION (2 credit hours)

**Elective Laboratory Course in Ecology and Evolutionary Biology**

Select 1 course from the following:

- 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 322 CONSERVATION BIOLOGY LAB
- BIOS 327 BIOLOGICAL DIVERSITY
- BIOS 330 INSECT BIOLOGY LAB
- BIOS 337 FIELD BIRD BIOLOGY LAB
- BIOS 339 PLANT DIVERSITY LAB
- BIOS 393 LABORATORY TRANSFER CREDIT IN BIOSCIENCES

**Elective Laboratory Course in Biochemistry and Cell Biology**

Select 1 course from the following:

- BIOS 211 INTERMEDIATE EXPERIMENTAL BIOSCIENCES (1-2 credit hours)

1 additional course (1-2 credit hours) from the Elective Laboratory Courses in Ecology and Evolutionary Biology (see course list above)

**Independent Research**

Select 1 from the following:

- BIOS 310 INDEPENDENT RESEARCH FOR BIOSCIENCES UNDERGRADUATES (5 credit hours)
- BIOS 401 UNDERGRADUATE HONORS RESEARCH & BIOS 402 and UNDERGRADUATE HONORS RESEARCH

**Capstone Requirement**

Select 1 from the following:

- BIOS 423 CONSERVATION BIOLOGY
- BIOS 431 BIOLOGY OF INFECTIOUS DISEASES

**Total Credit Hours Required for the Major in Biosciences and Major Concentration in Ecology and Evolutionary Biology**

Minimum of 69 credit hours

**Additional Credit Hours to Complete Degree Requirements**

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

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 major requirements may additionally meet distribution 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 CHEM 151 may be substituted for CHEM 121 or CHEM 111; CHEM 153 may be substituted for CHEM 123 or CHEM 113.
2 PHYS 101 and PHYS 103 or PHYS 111 may be substituted for PHYS 125.
3 STAT 280 may be substituted for STAT 305.
4 Students must select 1 elective course (3 credit hours) from courses offered by the Wiess School of Natural Sciences or the George R. Brown School of Engineering at the 200-level or above, designated as a lecture course. Courses offered by the Wiess School of Natural Sciences or the George R. Brown School of Engineering include the following subject codes: ASTR, BIOE, BIOS, CAAM, CEVE, CHBE, CHEM, COMP, DSCI, ELEC, ENGI, ESCI, GLHT, HEAL, KINE, MATH, MECH, MSNE, NEUR, NSCI, PHYS, RCEL, and STAT.
5 BIOS 310 must be taken for at least 3 credit hours per semester for a minimum of 3 semesters in order to fulfill the Independent Research.
6 The Capstone Requirement is in addition to the other lecture course requirements. The same course may not be used to satisfy more than one requirement for this major and/or major concentration.

Policies for the BS Degree with a Major in Biosciences and a Major Concentration 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 link for Undergraduate Studies: https://biosciences.rice.edu/.

Program Restrictions and Exclusions
Students pursuing the BS Degree with a Major in Biosciences and a Major Concentration in Ecology and Evolutionary Biology should be aware of the following program restrictions:

- Students pursuing the major in Biosciences may pursue only one major concentration within the major.
- Students pursuing the major in Biosciences 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/). 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.

Additional Information
For additional information, please see the BioSciences website: https://biosciences.rice.edu/

Opportunities for the BS Degree with a Major in Biosciences 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/) (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/). 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: https://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: https://biosciences.rice.edu/.

Additional Information
For additional information, please see the BioSciences website: https://biosciences.rice.edu/.