BACHELOR OF ARTS (BA) DEGREE WITH A MAJOR IN BIOLOGICAL SCIENCES

Program Learning Outcomes for the BA Degree with a Major in Biological Sciences

Upon completing the BA degree with a major in Biological Sciences, students will be able to:

1. Demonstrate a comprehensive knowledge of the field of biology, illustrated by the ability to describe the breadth of the discipline and to synthesize a range of biological concepts and ideas.
2. Demonstrate an understanding of the modern scientific method, including a familiarity with current methods for designing experiments and/or mathematical models, and the ability to analyze and interpret data.
3. Demonstrate effective oral and written communication skills, including an ability to communicate effectively and work with diverse groups.
4. 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.
5. Demonstrate understanding of the practice and culture of science, scientific ethics, and the relationship between science and society.
6. Develop quantitative reasoning via the construction of models and/or the analysis of data.

Requirements for the BA Degree with a Major in Biological Sciences

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

- A minimum of 28 courses (67 credit hours) to satisfy major requirements. Additional credit hours may be required depending on course selection.
- A minimum of 127 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 10 courses (24 credit hours) taken at the 300-level or above.

The BA degree with a major in Biological Sciences incorporates elements from both the Biochemistry and Cell Biology and the Ecology and Evolutionary Biology programs.

The courses listed below satisfy the requirements for this major. In certain instances, courses not on this official list may be substituted upon approval from 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/) 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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the Major in Biological Sciences</td>
<td>Minimum of 67</td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours Required for the BA Degree with a Major in Biological Sciences</td>
<td>Minimum of 127</td>
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### Degree Requirements

#### Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>MATH 101 or MATH 105</td>
<td>SINGLE VARIABLE CALCULUS I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 102 or MATH 106</td>
<td>SINGLE VARIABLE CALCULUS II</td>
<td>3</td>
</tr>
<tr>
<td>Select 1 from the following:</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>EBIO 338</td>
<td>DESIGN AND ANALYSIS OF BIOLOGICAL EXPERIMENTS</td>
<td></td>
</tr>
<tr>
<td>MATH 211</td>
<td>ORDINARY DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA</td>
<td></td>
</tr>
<tr>
<td>STAT 305</td>
<td>INTRODUCTION TO STATISTICS FOR BIOSCIENCES</td>
<td></td>
</tr>
<tr>
<td>CHEM 121 &amp; CHEM 123</td>
<td>GENERAL CHEMISTRY I and GENERAL CHEMISTRY LABORATORY I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 122 &amp; CHEM 124</td>
<td>GENERAL CHEMISTRY II and GENERAL CHEMISTRY LABORATORY II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 211 &amp; CHEM 213</td>
<td>ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY DISCUSSION</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 212 &amp; CHEM 214</td>
<td>ORGANIC CHEMISTRY II and ORGANIC CHEM DISCUSSION II</td>
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</tr>
<tr>
<td>CHEM 215</td>
<td>ORGANIC CHEMISTRY LAB</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 125</td>
<td>GENERAL PHYSICS (WITH LAB)</td>
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</tr>
<tr>
<td>PHYS 126</td>
<td>GENERAL PHYSICS II (WITH LAB)</td>
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#### Introductory Biology

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<thead>
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<tbody>
<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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#### Introductory Biology Labs

<table>
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<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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</tbody>
</table>

#### Advanced Biology Labs

Select 3 courses from the following: Minimum of 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>BIOC 311</td>
<td>ADVANCED EXPERIMENTAL BIOSCIENCES</td>
<td></td>
</tr>
<tr>
<td>BIOC 313</td>
<td>INTRODUCTORY SYNTHETIC BIOLOGY</td>
<td></td>
</tr>
<tr>
<td>BIOC 318</td>
<td>MICROBIOLOGY LABORATORY</td>
<td></td>
</tr>
<tr>
<td>BIOC 320 / BIOE 342</td>
<td>LABORATORY IN TISSUE CULTURE</td>
<td></td>
</tr>
</tbody>
</table>
BIOC 333  |  BIOINNOVATION STUDIO: FROM BASIC RESEARCH AND IDEATION TO TECHNOLOGY DEVELOPMENT
--- | ---
BIOC 413  |  EXPERIMENTAL MOLECULAR BIOLOGY
BIOC 415  |  EXPERIMENTAL PHYSIOLOGY
BIOC 530  |  LAB MODULE IN NMR SPECTROSCOPY AND MOLECULAR MODELING
BIOC 535  |  PRACTICAL X-RAY CRYSTALLOGRAPHY
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 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 /  |  LAB MODULE IN AQUATIC ECOLOGY WITH SCUBA
ENST 379  |  1 independent research experience

**Upper-Level Biology Course**
BIOC 301  |  BIOCHEMISTRY I

**Elective Requirements**

**Upper-Level Biology Courses**

*Select 1 course from the following:*  
- BIOC 300  |  PARADIGMS IN BIOCHEMISTRY AND CELL BIOLOGY
- BIOC 309  |  BIOCHEMISTRY II
- BIOC 341  |  CELL BIOLOGY
- BIOC 344  |  MOLECULAR BIOLOGY AND GENETICS
- BIOC 352  |  PHYSICAL CHEMISTRY FOR THE BIOSCIENCES

**Lecture Courses**

*Students must complete 5 courses as listed in the EBIO and BIOC Lecture Course Requirements below:*

**EBIO Lecture Courses**

*Select 3-4 courses from the following:*  
- EBIO 321  |  ANIMAL BEHAVIOR
- EBIO 323 / ENST 323  |  CONSERVATION BIOLOGY
- EBIO 325  |  ECOLOGY
- EBIO 326  |  INSECT BIOLOGY
- EBIO 328  |  EVOLUTION OF GENES & GENOMES
- EBIO 329 / BIOC 329  |  ANIMAL BIOLOGY AND PHYSIOLOGY
- EBIO 331 / BIOC 331  |  BIOLOGY OF INFECTIOUS DISEASES
- EBIO 333 / COMP 370  |  EVOLUTIONARY BIOINFORMATICS
- EBIO 334 / BIOC 334  |  EVOLUTION
- EBIO 336  |  PLANT DIVERSITY

**BIOC Lecture Courses**

*Select 1-2 courses from the following:*  
- BIOC 300  |  PARADIGMS IN BIOCHEMISTRY AND CELL BIOLOGY
- BIOC 309  |  BIOCHEMISTRY II
- BIOC 331  |  BIOLOGY OF INFECTIOUS DISEASES
- BIOC 332 / BIOE 302  |  SYSTEMS PHYSIOLOGY
- 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  |  METABOLIC ENGINEERING FOR GLOBAL HEALTH ENVIRONMENTS
- BIOC 368 / HUMA 368  |  CONCEIVING AND MISCONCEIVING THE MONSTROUS 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  |  FUNDAMENTALS OF CELLULAR AND MOLECULAR NEUROSCIENCE
- BIOC 390  |  TRANSFER CREDIT IN BIOCHEMISTRY AND CELL BIOLOGY
- BIOC 424  |  MICROBIOLOGY AND BIOTECHNOLOGY
- BIOC 425  |  PLANT MOLECULAR GENETICS AND DEVELOPMENT
- BIOC 442  |  MOLECULES, MEMORY AND MODEL ANIMALS: METHODS IN BEHAVIORAL NEUROSCIENCE
- 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 449  |  ADVANCED CELL AND MOLECULAR NEUROSCIENCE
- BIOC 450  |  VIRUSES AND INFECTIOUS DISEASES
Policies for the BA Degree with a Major in Biological Sciences

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/.

Program Restrictions and Exclusions
Students pursuing the major in Biological Sciences should be aware of the following program restriction:

- Students pursuing the major in Biological Sciences may not additionally pursue the major or minor in Biochemistry and Cell Biology.
- Students pursuing the major in Biological Sciences may not additionally pursue the major or minor 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.

Departmental Transfer Credit Guidelines
Students pursuing the major in Biological Sciences should be aware of the following 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/.

Opportunities for the BA Degree with a Major in Biological Sciences

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.

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/.
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/.

Additional Information
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