**MINOR IN BIOCHEMISTRY AND CELL BIOLOGY**

**Program Learning Outcomes for the Minor in Biochemistry and Cell Biology**

Upon completing the minor in Biochemistry and Cell Biology, students will be able to:

1. Demonstrate knowledge of biology with particular emphasis on biochemistry and cell biology.
2. Demonstrate effective oral and written communication skills, including the ability to interpret and communicate the results of biological research.
3. Demonstrate the critical thinking and analysis skills necessary to evaluate published and proposed research in the biological sciences.

**Requirements for the Minor in Biochemistry and Cell Biology**

Students pursuing the minor in Biochemistry and Cell Biology must complete:

- A minimum of 18 courses (minimum of 44 credit hours) to satisfy minor requirements.

The minor in Biochemistry and Cell Biology is intended for those with an interest in the life sciences but who may be majoring in other areas. This minor incorporates many of the life science core courses required for the health professions.

The courses listed below satisfy the requirements for this minor. In certain instances, courses not on this official list may be substituted upon approval of the minor’s academic advisor, or where applicable, the Program Director. (Course substitutions must be formally applied and entered into Degree Works by the minor’s Official Certifier (https://registrar.rice.edu/facstaff/degeworks/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>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS 211</td>
<td>INTERMEDIATE EXPERIMENTAL CELLULAR AND MOLECULAR BIOSCIENCES</td>
<td>2</td>
</tr>
</tbody>
</table>

**Lecture Course Requirement**

Select 1 course from the following:

- BIOS 300 | PARADIGMS IN BIOCHEMISTRY AND CELL BIOLOGY | 3 |
- BIOS 302 | BIOCHEMISTRY II |
- BIOS 334 | EVOLUTION |
- BIOS 340 | INTEGRATIVE ANIMAL PHYSIOLOGY |
- BIOS 344 | MOLECULAR BIOLOGY AND GENETICS |
- BIOS 352 | PHYSICAL CHEMISTRY FOR THE BIOSCIENCES |
- BIOS 353 | MOLECULAR BASIS FOR INFECTIOUS DISEASE |
- BIOS 368 | CONCEIVING AND MISCONCEIVING THE MONSTROUS IN FICTION AND IN ART, IN MEDICINE AND IN BIOSCIENCE |
- BIOS 372 | IMMUNOLOGY |
- BIOS 385 | CELLULAR AND MOLECULAR MECHANISMS OF THE NEURON |
- BIOS 390 | TRANSFER CREDIT IN BIOCHEMISTRY AND CELL BIOLOGY |
- BIOS 405 | PHYSICAL BIOLOGY |
- BIOS 410 | STEM CELL BIOLOGY |
- BIOS 420 | MOLECULAR BASIS OF DISEASES |
- BIOS 424 | MICROBIAL PHYSIOLOGY AND GENETICS |
- BIOS 425 | PLANT MOLECULAR GENETICS AND DEVELOPMENT |
- BIOS 441 | MOLECULAR MEMBRANE BIOLOGY |
- BIOS 443 | DEVELOPMENTAL NEUROBIOLOGY |
- BIOS 447 | EXPERIMENTAL BIOLOGY AND THE FUTURE OF MEDICINE |
- BIOS 450 | VIRUSES AND INFECTIOUS DISEASES |
- BIOS 460 | CANCER BIOLOGY |
- BIOS 470 | COMPUTATION WITH BIOLOGICAL DATA |
- BIOS 481 | MOLECULAR AND CELLULAR BIOPHYSICS |
- BIOS 482 | STRUCTURAL BIOLOGY |

**Core Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 101</td>
<td>SINGLE VARIABLE CALCULUS I</td>
<td>1</td>
</tr>
<tr>
<td>or MATH 105</td>
<td>AP/OTH CREDIT IN CALCULUS I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 102</td>
<td>SINGLE VARIABLE CALCULUS II</td>
<td>1</td>
</tr>
<tr>
<td>or MATH 106</td>
<td>AP/OTH CREDIT IN CALCULUS II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 125</td>
<td>GENERAL PHYSICS (WITH LAB)</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 126</td>
<td>GENERAL PHYSICS II (WITH LAB)</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>GENERAL CHEMISTRY I</td>
<td>3</td>
</tr>
<tr>
<td>or CHEM 111</td>
<td>AP/OTH CREDIT IN GENERAL CHEMISTRY I</td>
<td>3</td>
</tr>
</tbody>
</table>
Footnotes and Additional Information

1. MATH 111 and MATH 112 may be substituted for MATH 101 or MATH 105.
2. PHYS 101 and PHYS 103 or PHYS 111 may be substituted for PHYS 125; PHYS 102 and PHYS 104 or PHYS 112 may be substituted for PHYS 126. The BioSciences department has determined that credit awarded for PHYS 141 _CONCEPTS IN PHYSICS_ I and credit awarded for PHYS 142 _CONCEPTS IN PHYSICS_ II are not eligible for meeting the requirements of the Biochemistry and Cell Biology minor.
3. BIOS 212 may not be substituted for BIOS 211.
4. Lecture courses are noted in Rice's Course Catalog with a course type of "lecture". These courses do not include courses listed with a course type of "lecture/laboratory". For further details on course types, please see course descriptions (http://courses.rice.edu/).

Policies for the Minor in Biochemistry and Cell 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 by clicking on the Undergraduate Program tab on the department website (https://biosciences.rice.edu/).

Program Restrictions and Exclusions

Students pursuing the minor in Biochemistry and Cell Biology should be aware of the following program restrictions:

• As noted in Majors, Minors, and Certificates (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/), i) students may declare their intent to pursue a minor only after they have first declared a major, and ii) students may not major and minor in the same subject.

• Students pursuing the BA Degree or the BS Degree with a major in Biosciences and a major concentration in Biochemistry may not additionally declare the minor in Biochemistry and Cell Biology.

• Students pursuing the BA Degree or the BS Degree with a major in Biosciences and a major concentration in Cell Biology and Genetics may not additionally declare the minor in Biochemistry and Cell Biology.

• Students pursuing the BA Degree or the BS Degree with a major in Biosciences and a major concentration in Integrative Biology may not additionally declare the minor in Biochemistry and Cell 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 (https://oaa.rice.edu/advising-network/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 minor in Biochemistry and Cell 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: https://biosciences.rice.edu/.

Opportunities for the Minor in Biochemistry and Cell 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.

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 by clicking on the Research tab on the department website (https://biosciences.rice.edu/).

Additional Information

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