

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/degreeworks/officialcertifier/) (<https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/>)). Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
Total Credit Hours Required for the Minor in Biochemistry and Cell Biology		Minimum of 44

Minor Requirements

Code	Title	Credit Hours
Core Requirements		
MATH 101 or MATH 105	SINGLE VARIABLE CALCULUS I ¹ AP/OTH CREDIT IN CALCULUS I	3
MATH 102 or MATH 106	SINGLE VARIABLE CALCULUS II AP/OTH CREDIT IN CALCULUS II	3
PHYS 125	GENERAL PHYSICS (WITH LAB) ²	4
PHYS 126	GENERAL PHYSICS II (WITH LAB) ²	4
CHEM 121 or CHEM 111	GENERAL CHEMISTRY I AP/OTH CREDIT IN GENERAL CHEMISTRY I	3

CHEM 123 or CHEM 113	GENERAL CHEMISTRY LABORATORY I AP/OTH CREDIT IN GENERAL CHEMISTRY LAB I	1
CHEM 122 or CHEM 112	GENERAL CHEMISTRY II AP/OTH CREDIT IN GENERAL CHEMISTRY II	3
CHEM 124 or CHEM 114	GENERAL CHEMISTRY LABORATORY II AP/OTH CREDIT IN GENERAL CHEMISTRY LAB II	1
CHEM 211 & CHEM 213	ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY DISCUSSION I	3
CHEM 215 or CHEM 365	ORGANIC CHEMISTRY LAB ORGANIC CHEMISTRY LAB	2
CHEM 313 & CHEM 314	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY DISCUSSION II	3
BIOS 201	INTRODUCTORY BIOLOGY I	3
BIOS 301	BIOCHEMISTRY I	3
BIOS 341	CELL BIOLOGY	3
Lab Course Requirement		
BIOS 211	INTERMEDIATE EXPERIMENTAL CELLULAR AND MOLECULAR BIOSCIENCES ³	2
Lecture Course Requirement		
<i>Select 1 course from the following:</i> ⁴		3
BIOS 300	PARADIGMS IN BIOCHEMISTRY AND CELL BIOLOGY	
BIOS 302	BIOCHEMISTRY II	
BIOS 334	EVOLUTION	
BIOS 340	ANIMAL PHYSIOLOGY	
BIOS 344	MOLECULAR BIOLOGY AND GENETICS	
BIOS 352	PHYSICAL CHEMISTRY FOR THE BIOSCIENCES	
BIOS 353	MICROBIOLOGY: THE MOLECULAR BASIS FOR INFECTIOUS DISEASES AND THEIR TREATMENT	
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

Total Credit Hours	Minimum of 44
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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/) (<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/) (<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/) (<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/) (<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/) (<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/) (<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/) (<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/) (<https://biosciences.rice.edu/>).

Additional Information

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