

# COMPUTATIONAL BIOCHEMISTRY B.S.

The Biochemistry Program is a joint program between the Department of Chemistry and Biochemistry and the Division of Biological Sciences. Biochemistry is an interdisciplinary science that integrates chemistry and biology to understand the molecular basis of life. The program offers a B.S. in Biochemistry, a B.S. in Computational Biochemistry and M.S. and Ph.D. degrees in Biochemistry & Biophysics. The Biochemistry Program is accredited by the American Society for Biochemistry and Molecular Biology (ASBMB).

The program also offers a B.S. in Computational Biochemistry. This degree incorporates both foundational and advanced level courses in chemistry, biology, computer science and biochemistry to prepare students who plan to pursue careers in computationally intensive fields including bioinformatics, molecular-modeling and structure-based design.

## General Degree Requirements

To earn a baccalaureate degree, all students must complete successfully, in addition to any other requirements, the University of Montana General Education Requirements. Please refer to the General Education Requirements page (<https://catalog.umt.edu/academics/general-education-requirements/>) for more information.

Additional requirements for graduation can be found on the Degree/Certificate Requirements for Graduation page (<https://catalog.umt.edu/academics/graduation-requirements/>).

Unless otherwise noted in individual program requirements, a minimum grade point average of 2.00 in all work attempted at the University of Montana-Missoula is required for graduation. Please see the Academic Policies and Procedures page (<https://catalog.umt.edu/academics/policies-procedures/>) for information on how your GPA is calculated.

Courses taken to satisfy the requirements of a major, minor, or certificate program must be completed with a grade of C- or better unless a higher grade is noted in the program requirements.

## BACHELOR OF SCIENCE - COMPUTATIONAL BIOCHEMISTRY

### Course Requirements

Code	Title	Hours
<b>Lower-Division Core</b>		
Complete all of the following courses:		
BCH 294	Seminar/Workshop	1
BIOB 160	Principles of Living Systems	3
BIOB 161N	Principles of Living Systems Lab	1
BIOB 272	Genetics and Evolution	4
CSCI 151	Interdisciplinary Computer Science I	3
CSCI 152	Interdisciplinary Computer Science II	3
CSCI 232	Intermediate Data Structures and Algorithms	4
CHMY 141N	College Chemistry I	4
CHMY 142N	College Chemistry I Lab	1
CHMY 143N	College Chemistry II	4

CHMY 144N	College Chemistry II Lab	1
CHMY 221	Organic Chemistry I	3
CHMY 222	Organic Chemistry I Lab	2
CHMY 223	Organic Chemistry II	3
CHMY 224	Organic Chemistry II Lab	2
PHSX 215N	Fundamentals of Physics with Calculus I	4
PHSX 216N	Physics Laboratory I with Calculus	1
PHSX 217N	Fundamentals of Physics with Calculus II	4
PHSX 218N	Physics Laboratory II with Calculus	1
M 171	Calculus I	4
M 172	Calculus II	4

### Upper-Division Core

Complete all of the following courses:

BCH 480	Advanced Biochemistry I	3
BCH 482	Advanced Biochemistry II	3
BCH 486	Biochemistry Research Lab	3
BIOB 486	Genomics	3
CHMY 311	Analytical Chemistry-Quantitative Analysis	4
CHMY 373	Physical Chemistry-Kinetics & Thermodynamics	4
CHMY 421	Advanced Instrument Analysis	4
CSCI 315E	Computers, Ethics, and Society	3
CSCI 451	Computational Biology	3

### Advanced Electives <sup>1</sup>

Complete 3 credits from the following courses:		3
CSCI 332	Advanced Data Structures and Algorithms	
CSCI 340	Database Design	
CSCI 444	Data Visualization	
CSCI 447	Machine Learning	
Complete 6 credits from the following courses:		6
BCH 490	Undergraduate Research	
BIOB 301	Developmental Biology	
BIOB 375	General Genetics	
BIOB 410	Immunology	
BIOB 411	Immunology Laboratory	
BIOB 425	Advanced Cellular & Molecular Biology	
BIOB 490	Advanced Undergraduate Research	
BIOH 365	Human Anatomy and Physiology for Health Professions I	
BIOH 370	Human Anatomy and Physiology for Health Professions II	
BIOH 405	Hematology	
BIOH 462	Principles of Medical Physiology	
BIOM 360	General Microbiology	
BIOM 361	General Microbiology Lab	
BIOM 410	Microbial Genetics	
BIOM 411	Experimental Microbial Genetics Lab	
BIOM 427	General Parasitology	
BIOM 428	General Parasitology Lab	
BIOM 435	Virology	
CHMY 371	Physical Chemistry-Quantum Chemistry & Spectroscopy	
CHMY 397	Teaching Chemistry	

CHMY 401	Advanced Inorganic Chemistry
CHMY 402	Advanced Inorganic Chemistry Lab
CHMY 442	Aquatic Chemistry
CHMY 465	Organic Spectroscopy
CHMY 466	FT-NMR Option for Undergraduate Research
CHMY 490	Undergraduate Research
CHMY 494	Seminar/Workshop
CHMY 498	Internship/Cooperative Education
PHAR 421	Medicinal Chemistry I
PHAR 422	Medicinal Chemistry II

**Advanced Writing Requirement**

To complete the Advanced College Writing Requirement, Biochemistry students take BCH 482 and BCH 486 or any other stand-alone advanced writing course.

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**Total Hours** **96**

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No more than 3 credits combined of BIOB 490, CHMY 490, CHMY 498 and BCH 490. No more than 3 credits combined of CHMY 397 and CHMY 494.