

# 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 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).

Undergraduate majors receive a solid foundation in both chemistry and biology. Biochemistry courses are usually taken in the junior year allowing majors to become involved in research with faculty and to take electives in their senior year. The major also introduces students to computer science, an essential tool in modern biochemistry. The B.S. in Biochemistry prepares students for advanced degrees in biochemistry or biophysics, for medical, dental or veterinary schools and for careers in the pharmaceutical and biotechnology industries. A Health Professions option is also offered within the B.S. in Biochemistry for students whose career goals are in fields related to biochemistry, particularly medical school. This option is designed so that students can complete all coursework necessary for the MCAT and other exams required for health-related professional schools by the end of their third year. Students desiring a basic grounding in biochemistry to complement their primary major can choose to pursue a minor in Biochemistry. All students completing a major or minor in Biochemistry are eligible to take the ASBMB certification exam in their junior or senior year.

The graduate degrees in Biochemistry & Biophysics prepare students to be independent researchers in academic laboratories or in the biotechnology and pharmaceutical industries. Through coursework and independent research, graduate students in this program will become adept at the physical and structural methods necessary to probe important problems in the life sciences at the molecular level. In collaboration with the Center for Biomolecular Structure & Dynamics, the Biochemistry Program provides state-of-the-art facilities for research in biochemistry, biophysics and structural biology.

Prospective students desiring further information on these degrees should contact the Program Director by visiting the Biochemistry Program web site: <http://hs.umt.edu/biochemistry/>

**High School Preparation:** In addition to the general University admission requirements, it is strongly recommended that a student take four years of mathematics, four years of science, and a foreign language.

## Bachelor of Science - Biochemistry

### College of Humanities & Sciences

**Degree Specific Credits:** 95-96

**Required Cumulative GPA:** 2.0

**Catalog Year:** 2018-2019

### General Education Requirements

Information regarding these requirements can be found in the General Education Section (<http://catalog.umt.edu/academics/general-education-requirements>) of the catalog.

## Summary

Code	Title	Hours
Lower-Division Core		54
	Biochemistry	
	Biology	
	General and Organic Chemistry	
	Physics	
	Mathematics	
	Computer Science	
Upper-Division Core		27
	Biochemistry	
	Biology	
	Analytical Chemistry	
	Inorganic Chemistry	
	Physical Chemistry	
Advanced Electives		15
Total Hours		96

### Lower-Division Core

**Rule:** Must complete the following subcategories. 54 total credits required.

#### Biochemistry

Code	Title	Hours
<b>Complete all of the following courses:</b>		
BCH 110	Intro Biology for Biochemists	3
BCH 111	Intro Biol for Biochemists Lab	1
BCH 294	Seminar/Workshop	1
Total Hours		5

Minimum Required Grade: C-

#### Biology

Code	Title	Hours
<b>Complete all of the following courses:</b>		
BIOB 260	Cellular and Molecular Biology	4
BIOB 272	Genetics and Evolution	4
Total Hours		8

Minimum Required Grade: C-

#### General and Organic Chemistry

Code	Title	Hours
<b>Complete all of the following courses:</b>		
CHMY 141N & CHMY 142N	College Chemistry I and College Chemistry I Lab	5
CHMY 143N & CHMY 144N	College Chemistry II and College Chemistry II Lab	5
CHMY 221 & CHMY 222	Organic Chemistry I and Organic Chemistry I Lab	5
CHMY 223 & CHMY 224	Organic Chemistry II and Organic Chemistry II Lab	5
Total Hours		20

Minimum Required Grade: C-

**Physics**

Code	Title	Hours
<b>Complete all of the following courses:</b>		
PHSX 215N & PHSX 216N	Fund of Physics w/Calc I and Physics Laboratory I w/Calc	5
PHSX 217N & PHSX 218N	Fund of Physics w/Calc II and Physics Laboratory II w/Calc	5
Total Hours		10

Minimum Required Grade: C-

**Mathematics**

Code	Title	Hours
<b>Complete all of the following courses:</b>		
M 171	Calculus I	4
M 172	Calculus II	4
Total Hours		8

Minimum Required Grade: C-

**Computer Science**

Code	Title	Hours
<b>Complete the following course:</b>		
CSCI 125	Computation in the Sciences	3
Total Hours		3

Minimum Required Grade: C-

**Upper Division Core**

**Rule:** Must complete the following subcategories. 27 total credits required.

**Biochemistry**

Code	Title	Hours
<b>Complete all of the following courses:</b>		
BCH 480	Advanced Biochemistry I	3
BCH 482	Advanced Biochemistry II	3
BCH 486	Biochemistry Research Lab	3
Total Hours		9

Minimum Required Grade: C-

**Biology**

Code	Title	Hours
<b>Complete the following course:</b>		
BIOB 425	Adv Cell & Molecular Biology	3
Total Hours		3

Minimum Required Grade: C-

**Analytical Chemistry**

Code	Title	Hours
<b>Complete all of the following courses:</b>		
CHMY 311	Analytical Chem-Quant Analysis	4

CHMY 421	Advanced Instrument Analysis	4
Total Hours		8

Minimum Required Grade: C-

**Inorganic Chemistry**

Code	Title	Hours
<b>Complete the following course:</b>		
CHMY 401	Advanced Inorganic Chemistry	3
Total Hours		3

Minimum Required Grade: C-

**Physical Chemistry**

**Note:** Students planning to attend graduate school in biochemistry or biophysics are strongly advised to take the CHMY 373-CHMY 371 sequence

Code	Title	Hours
<b>Complete one of the following courses:</b>		
CHMY 373	Phys Chem-Kntcs & Thrmdynmcs	4
Total Hours		4

Minimum Required Grade: C-

**Advanced Electives**

**Note:** 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.

Code	Title	Hours
<b>Complete 15 credits from the following courses:</b>		15
BCH 490	Undergraduate Research	
BIOB 301	Developmental Biology	
BIOB 375	General Genetics	
BIOB 410	Immunology	
BIOB 411	Immunology Laboratory	
BIOB 440	Biological Electron Microscopy	
BIOB 486	Genomics	
BIOB 490	Adv Undergrad Research	
BIOH 365	Human AP I for Health Profsns	
BIOH 370	Human AP II for Health Profsns	
BIOH 405	Hematology	
BIOH 462	Principles Medical Physiology	
BIOM 360	General Microbiology	
BIOM 361	General Microbiology Lab	
BIOM 410	Microbial Genetics	
BIOM 411	Exprmntl Microbial Genetcs Lab	
BIOM 427	General Parasitology	
BIOM 428	General Parasitology Lab	
BIOM 435	Virology	
CHMY 371	Phys Chem-Qntm Chm & Spctrsncpy	
CHMY 397	Teaching Chemistry	
CHMY 402	Advanced Inorganic Chem Lab	
CHMY 403	Descriptive Inorganic Chem	
CHMY 442	Aquatic Chemistry	

CHMY 465	Organic Spectroscopy
CHMY 466	FT-NMR Optn for Undrgrd Rsrch
CHMY 485	Laboratory Safety
CHMY 490	Undergraduate Research
CHMY 494	Seminar/Workshop
CHMY 498	Internship/Cooperative Educ
CSCI 451	Computational Biology
PHAR 421	Medicinal Chem I
PHAR 422	Medicinal Chem II
Total Hours	15

Minimum Required Grade: C-