

# 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.

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. This option allows more flexibility in upper division electives, permitting students to tailor the degree to their needs.

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 Humanities & Sciences

Degree Specific Credits: 96

Required Cumulative GPA: 2.0

Catalog Year: 2017-2018

### 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

Lower Division Core	54
Biochemistry	
Biology	
General and Organic Chemistry	
Physics	

Mathematics	
Computer Science	
Upper Division Core	26
Biochemistry	
Biology	
Analytical Chemistry	
Inorganic Chemistry	
Physical Chemistry	
Advanced Electives	16
Total Hours	96

### Lower Division Core

**Rule:** Must complete the following subcategories

54 Total Credits Required

#### Biochemistry

**Rule:** All of the following courses are required

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

**Rule:** All of the following courses are required

BIOB 260	Cellular and Molecular Biology	4
BIOB 272	Genetics and Evolution	4
Total Hours		8

Minimum Required Grade: C-

#### General and Organic Chemistry

**Rule:** All of the following courses are required

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
Total Hours		20

Minimum Required Grade: C-

#### Physics

**Rule:** All of the following courses are required

PHSX 215N	Fund of Physics w/Calc I	4
PHSX 216N	Physics Laboratory I w/Calc	1
PHSX 217N	Fund of Physics w/Calc II	4

PHSX 218N	Physics Laboratory II w/Calc	1
Total Hours		10

Minimum Required Grade: C-

### Mathematics

**Rule:** All of the following courses are required

M 171	Calculus I	4
M 172	Calculus II	4
Total Hours		8

Minimum Required Grade: C-

### Computer Science

**Rule:** The following course is required

**Note:** We advise that students take CSCI 250 in their third year after completing lower division biochemistry, biology, chemistry, mathematics and physics coursework.

CSCI 250	Computer Mdlng/Science Majors	3
Total Hours		3

Minimum Required Grade: C-

## Upper Division Core

**Rule:** Must complete the following subcategories

26 Total Credits Required

### Biochemistry

**Rule:** All of the following courses are required

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

**Rule:** The following course is required

BIOB 425	Adv Cell & Molecular Biology	3
Total Hours		3

Minimum Required Grade: C-

### Analytical Chemistry

**Rule:** All of the following courses are required

CHMY 311	Analytical Chem-Quant Analysis	4
CHMY 421	Advanced Instrument Analysis	4
Total Hours		8

Minimum Required Grade: C-

### Inorganic Chemistry

**Rule:** The following course is required

CHMY 401	Advanced Inorganic Chemistry	3
Total Hours		3

Minimum Required Grade: C-

### Physical Chemistry

**Rule:** Choose 1 of the following courses

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

CHMY 360	Applied Physical Chemistry	3-4
or CHMY 373	Phys Chem-Kntcs & Thrmdynmcs	
Total Hours		3-4

Minimum Required Grade: C-

## Advanced Electives

**Rule:** Choose 16 credits from the courses listed

**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.

Select 16 credits from the following: 16

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 400	Medical Microbiology
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 & Spctrsctpy
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 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	16

Minimum Required Grade: C-