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

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<td>Biology</td>
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<td>General and Organic Chemistry</td>
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Mathematics

Computer Science

Upper Division Core

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 & Thrmodynmc
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-Ontm Chm & Spctrscpy  
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
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<tr>
<th>Course Code</th>
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<tr>
<td>CSCI 451</td>
<td>Computational Biology</td>
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<tr>
<td>PHAR 421</td>
<td>Medicinal Chem I</td>
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<tr>
<td>PHAR 422</td>
<td>Medicinal Chem II</td>
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Total Hours 16

Minimum Required Grade: C-