BIOCHEMISTRY HEALTH PROFESSIONS

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.

Bachelor of Science - Biochemistry; Health Professions Concentration

College Humanities & Sciences

Degree Specific Credits: 99

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 50-51

Biochemistry

Biology

General and Organic Chemistry

Physics

Mathematics

Upper Division Core 25-26

Biochemistry

Microbiology

Analytical Chemistry

Inorganic Chemistry

Physical Chemistry

Biology Laboratory Course

Advanced Electives 21

Ethics 3

Total Hours 99-101

Lower Division Core

Rule: Must complete the following subcategories

50 Total Credits Required

Biochemistry

Rule: All of the following courses are required

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCH 110</td>
<td>Intro Biology for Biochemists</td>
<td>3</td>
</tr>
<tr>
<td>BCH 111</td>
<td>Intro Biol for Biochemists Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

BCH 294 Seminar/Workshop 1

Total Hours 5

Minimum Required Grade: C-

Biology

Rule: All of the following courses are required

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOB 260</td>
<td>Cellular and Molecular Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOB 272</td>
<td>Genetics and Evolution</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours 8

Minimum Required Grade: C-

General and Organic Chemistry

Rule: All of the following courses are required

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHMY 141N</td>
<td>College Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHMY 142N</td>
<td>College Chemistry I Lab</td>
<td>1</td>
</tr>
<tr>
<td>CHMY 143N</td>
<td>College Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CHMY 144N</td>
<td>College Chemistry II Lab</td>
<td>1</td>
</tr>
<tr>
<td>CHMY 221</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHMY 222</td>
<td>Organic Chemistry I Lab</td>
<td>2</td>
</tr>
<tr>
<td>CHMY 223</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHMY 224</td>
<td>Organic Chemistry II Lab</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Hours 20

Minimum Required Grade: C-

Physics

Rule: Either the PHSX 205N-PHSX 208N or the PHSX 215N-PHSX 218N sequence may be completed

Select one of the following sequences: 10

Sequence 1:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSX 205N</td>
<td>College Physics I</td>
<td></td>
</tr>
<tr>
<td>PHSX 206N</td>
<td>College Physics I Laboratory</td>
<td></td>
</tr>
<tr>
<td>PHSX 207N</td>
<td>College Physics II</td>
<td></td>
</tr>
<tr>
<td>PHSX 208N</td>
<td>College Physics II Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

Sequence 2:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSX 215N</td>
<td>Fund of Physics w/Calc I</td>
<td></td>
</tr>
<tr>
<td>PHSX 216N</td>
<td>Physics Laboratory I w/Calc</td>
<td></td>
</tr>
<tr>
<td>PHSX 217N</td>
<td>Fund of Physics w/Calc II</td>
<td></td>
</tr>
<tr>
<td>PHSX 218N</td>
<td>Physics Laboratory II w/Calc</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 10

Minimum Required Grade: C-

Mathematics

Rule: Either the M 162/M 263 sequence or the M 171/M 172 sequence may be completed

Select one of the following: 7-8

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 162</td>
<td>Applied Calculus</td>
<td></td>
</tr>
<tr>
<td>&amp; M 263</td>
<td>and Applied Differential Equations</td>
<td></td>
</tr>
<tr>
<td>M 171</td>
<td>Calculus I</td>
<td></td>
</tr>
<tr>
<td>&amp; M 172</td>
<td>and Calculus II</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 7-8
Minimum Required Grade: C-

**Upper Division Core**

**Biochemistry**

*Rule:* Must complete the following subcategories

25 Total Credits Required

- **BCH 480** Advanced Biochemistry I 3
- **BCH 482** Advanced Biochemistry II 3

Total Hours 6

Minimum Required Grade: C-

**Microbiology**

*Rule:* The following course is required

- **BIOM 360** General Microbiology (equiv to 260) 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

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

Total Hours 3-4

Minimum Required Grade: C-

**Biology Laboratory Course**

*Rule:* Choose one of the following lab courses

Select one of the following: 2

- **BIOB 411** Immunology Laboratory
- **BIOB 440** Biological Electron Microscopy
- **BIOM 361** General Microbiology Lab
- **BIOM 428** General Parasitology Lab

Total Hours 2

Minimum Required Grade: C-

**Advanced Electives**

*Rule:* Choose 21 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 21 credits from the following: 21

- **BCH 486** Biochemistry Research Lab
- **BCH 490** Undergraduate Research
- **BIOB 301** Developmental Biology
- **BIOB 375** General Genetics
- **BIOB 410** Immunology
- **BIOB 411** Immunology Laboratory
- **BIOB 425** Adv Cell & Molecular Biology
- **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 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 & 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
- **PHAR 421** Medicinal Chem I
- **PHAR 422** Medicinal Chem II

Total Hours 21

Minimum Required Grade: C-

**Ethics**

*Rule:* Complete the following course

- **CHMY 305E** Ethics, Literature and Writing in the Sciences 3

Total Hours 3

Minimum Required Grade: C-