Biology - Human Biological Sciences

Bachelor of Science - Biology; Human Biological Sciences Concentration

College Humanities & Sciences

Degree Specific Credits: 73
Required Cumulative GPA: 2.0
Catalog Year: 2017-2018

Note: The Human Biological Sciences concentration is a pre-professional program for students planning careers in a health-related field. The following is a partial list of possible professions: physical therapy, medicine, dentistry, physician’s assistant, alternative medicine, nutrition, and public health.

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

Biology/Microbiology Lower Division Core 17
Upper Division Core Courses Required by Human Biological Sciences Concentration 14
Additional Upper Division Major Courses Required for the Human Biological Sciences Concentration 13-20
Biochemistry Requirement
Microbiology Requirement
Additional Depth in Human Biological Sciences
Required Courses Outside of the Major 30-42
Mathematics and Psychology
Chemistry
Physics
Upper Division Writing Expectation for the Major 3-15
Total Hours 77-108

Biology/Microbiology Lower Division Core

Rule: All of the following courses are required.

Note: The lower division core should be completed before attempting most upper division major courses.

AP Biology credit may be substituted for either BIOB 160N/BIOB 161N or BIOB 170N/BIOB 171N.

BIOB 160N Principles of Living Systems 3
BIOB 161N Prncpls of Living Systems Lab 1
BIOB 170N Principles of Biological Diversity 3
BIOB 171N Principles Biological Dvrsity Lab 2
BIOB 260 Cellular and Molecular Biology 4

Upper Division Core Courses Required by Human Biological Sciences Concentration

Rule: All of the following courses are required.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOB 301</td>
<td>Developmental Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOB 375</td>
<td>General Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIOH 365</td>
<td>Human AP I for Health Profsns</td>
<td>4</td>
</tr>
<tr>
<td>BIOH 370</td>
<td>Human AP II for Health Profsns</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>14</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

Additional Upper Division Major Courses Required for the Human Biological Sciences Concentration

Minimum Required Grade: C-

Biochemistry Requirement

Select one of the following: 4-6

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BCH 380</td>
<td>Biochemistry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Full Year:</td>
</tr>
<tr>
<td></td>
<td>BCH 480</td>
<td>Advanced Biochemistry I</td>
</tr>
<tr>
<td></td>
<td>BCH 482</td>
<td>Advanced Biochemistry II</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-6</td>
<td></td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

Microbiology Requirement

Select one of the following: 3-5

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>BIOM 360 &amp; BIOM 361</td>
<td>General Microbiology and General Microbiology Lab (equiv to 260 &amp; 261)</td>
</tr>
<tr>
<td>BIOM 400</td>
<td>Medical Microbiology</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
</tr>
<tr>
<td></td>
<td>3-5</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

Additional Depth in Human Biological Sciences

Complete at least two courses from the following: 6-9

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCH 486</td>
<td>Biochemistry Research Lab</td>
</tr>
<tr>
<td>BIO 410</td>
<td>Immunology</td>
</tr>
<tr>
<td>BIOB 425</td>
<td>Adv Cell &amp; Molecular Biology</td>
</tr>
<tr>
<td>BIOB 468</td>
<td>Endocrinology</td>
</tr>
<tr>
<td>BIOB 483</td>
<td>Phylogenics and Evolution</td>
</tr>
<tr>
<td>BIOB 486</td>
<td>Genomics</td>
</tr>
<tr>
<td>BIOB 499</td>
<td>Undergraduate Thesis</td>
</tr>
<tr>
<td>BIOE 403</td>
<td>Vert Design &amp; Evolution</td>
</tr>
<tr>
<td>BIOE 406</td>
<td>Behavior &amp; Evolution</td>
</tr>
<tr>
<td>BIOH 462</td>
<td>Principles Medical Physiology</td>
</tr>
<tr>
<td>BIOL 435</td>
<td>Comparative Animal Physiology</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-
Biology - Human Biological Sciences

BIOM 402 Medical Bacteriology & Mycology
BIOM 410 Microbial Genetics
BIOM 427 General Parasitology & General Parasitology Lab
BIOM 435 Virology
BIOM 450 Microbial Physiology

Total Hours 6-9

Minimum Required Grade: C-

Required Courses Outside of the Major

Minimum Required Grade: C-

Mathematics and Psychology

Rule: All of the following courses are required

M 162 Applied Calculus 4
or M 171 Calculus I 3
PSYX 100S Intro to Psychology 3
STAT 216 Introduction to Statistics 4

Total Hours 11

Minimum Required Grade: C-

Chemistry

Note: If you plan to apply to a graduate or professional school such as medical or dental, you should plan to complete the advanced chemistry sequence. If you plan to pursue nursing or a graduate program in physical therapy, the introductory chemistry sequence is sufficient. The advanced chemistry option is more flexible, and keeps more options open for future careers. Check the requirements of your intended professional program to help determine which sequence is right for you.

Select either one or two years of chemistry from the following: 8-20

One Year:

CHMY 121N Introduction to General Chemistry
CHMY 123 Introduction to Organic and Biochemistry
& CHMY 124 and Introduction to Organic and Biochemistry Lab

Two Years:

CHMY 141N College Chemistry I
CHMY 142N College Chemistry I Lab
CHMY 143N College Chemistry II
CHMY 144N College Chemistry II Lab
CHMY 221 Organic Chemistry I
& CHMY 222 and Organic Chemistry I Lab
CHMY 223 Organic Chemistry II
& CHMY 224 and Organic Chemistry II Lab

Total Hours 8-20

Minimum Required Grade: C-

Physics

Rule: All of the following courses are required.

Select one of the following physics sequences: 10

Algebra- and Trigonometry-based:

PHSX 205N College Physics I
& PHSX 206N and College Physics I Laboratory

PHSX 207N College Physics II
& PHSX 208N and College Physics II Laboratory

Calculus-based:

PHSX 215N Fund of Physics w/Calc I
& PHSX 216N and Physics Laboratory I w/Calc

PHSX 217N Fund of Physics w/Calc II
& PHSX 218N and Physics Laboratory II w/Calc

Total Hours 10

Minimum Required Grade: C-

Advanced College Writing Requirement

Rule: Complete the equivalent of a full writing course (either three 1/3 writing courses or one 2/3 writing course + one 1/3 writing course or one complete writing course)

Note: To meet the Advanced College Writing Requirement, Biology students take 2 or 3 partial writing courses (either three 1/3 writing courses or one 1/3 writing course and one 2/3 writing course) or one complete writing course. The Human Biological Sciences concentration does not require a specific advanced writing course.

Minimum Required Grade: C-

1/3 Advanced Writing Courses

BCH 482 Advanced Biochemistry II 3
BIOB 410 Immunology 3
BIOB 425 Adv Cell & Molecular Biology 3
BIOB 483 Phylogenics and Evolution 3
BIOE 403 Vert Design & Evolution 5
BIOE 409 Behavior & Evolution Discussion 1
BIOE 428 Freshwater Ecology 5
BIOL 484 Plant Evolution 3
BIOM 402 Medical Bacteriology & Mycology 3
BIOO 320 General Botany 5
BIOO 434 Plant Physiology Lab 1
BIOO 470 Ornithology 4
BIOO 475 Mammalogy 4

Minimum Required Grade: C-

2/3 Advanced Writing Courses

BCH 486 Biochemistry Research Lab 3
BCH 499 Senior Thesis/Capstone 3-6
BIOB 411 Immunology Laboratory 2
BIOB 499 Undergraduate Thesis 3-6
BIOE 342 Field Ecology 5
BIOE 371 Gen Ecology Lab (equiv to 271) 2
BIMO 411 Exprmntl Microbial Genetcs Lab 1
BIMO 499 Undergraduate Thesis 3-6

Minimum Required Grade: C-

Complete UD Writing Course

BIOH 462 Principles Medical Physiology 3
**Exception to the Modern/Classical Languages Requirement**

**Rule:** Choose one of the following Math courses

**Note:** The Division of Biological Sciences has been granted an exception to the Modern/Classical Language Requirement. Either of these Calculus courses (required by the major) will satisfy this requirement.

<table>
<thead>
<tr>
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<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 162</td>
<td>Applied Calculus</td>
<td>4</td>
</tr>
<tr>
<td>or M 171</td>
<td>Calculus I</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours: 4

Minimum Required Grade: C-