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 Pnrcpls of Living Systems Lab 1
BIOB 170N Principls Biological Diversity 3
BIOB 171N Principls Biological Dvrsty Lab 2
BIOB 260 Cellular and Molecular Biology 4

BIOB 272 Genetics and Evolution 4
Total Hours 17
Minimum Required Grade: C-

Upper Division Core Courses Required by Human Biological Sciences Concentration

Rule: All of the following courses are required.

BIOB 301 Developmental Biology 3
BIOB 375 General Genetics 3
BIOH 365 Human AP I for Health Profsns 4
BIOH 370 Human AP II for Health Profsns 4
Total Hours 14
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
One Semester:
BCH 380 Biochemistry
Full Year:
BCH 480 Advanced Biochemistry I
BCH 482 Advanced Biochemistry II
Total Hours 4-6
Minimum Required Grade: C-

Microbiology Requirement
Select one of the following: 3-5
BIOM 360 & BIOM 361 General Microbiology and General Microbiology Lab (equiv to 260 & 261)
BIOM 400 Medical Microbiology
Total Hours 3-5
Minimum Required Grade: C-

Additional Depth in Human Biological Sciences

Complete at least two courses from the following: 6-9
BCH 486 Biochemistry Research Lab
BIOB 410 Immunology
BIOB 425 Adv Cell & Molecular Biology
BIOB 468 Endocrinology
BIOB 483 Phylogenics and Evolution
BIOB 486 Genomics
BIOB 499 Undergraduate Thesis
BOE 403 Vert Design & Evolution
BOE 406 Behavior & Evolution
BIOH 462 Principles Medical Physiology
BIOL 435 Comparative Animal Physiology
### Required Courses Outside of the Major

**Mathematics and Psychology**

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</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>
<tr>
<td>PSYX 100S</td>
<td>Intro to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>STAT 216</td>
<td>Introduction to Statistics</td>
<td>4</td>
</tr>
</tbody>
</table>

**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:**

<table>
<thead>
<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>CHMY 121N</td>
<td>Introduction to General Chemistry</td>
</tr>
<tr>
<td>CHMY 123 &amp; CHMY 124</td>
<td>Introduction to Organic and Biochemistry and Introduction to Organic and Biochemistry Lab</td>
</tr>
</tbody>
</table>

**Two Years:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>CHMY 141N</td>
<td>College Chemistry I</td>
</tr>
<tr>
<td>CHMY 142N</td>
<td>College Chemistry I Lab</td>
</tr>
<tr>
<td>CHMY 143N</td>
<td>College Chemistry II</td>
</tr>
<tr>
<td>CHMY 144N</td>
<td>College Chemistry II Lab</td>
</tr>
<tr>
<td>CHMY 221 &amp; CHMY 222</td>
<td>Organic Chemistry I and Organic Chemistry I Lab</td>
</tr>
<tr>
<td>CHMY 223 &amp; CHMY 224</td>
<td>Organic Chemistry II and Organic Chemistry II Lab</td>
</tr>
</tbody>
</table>

**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:**

<table>
<thead>
<tr>
<th>Course Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>PHSX 205N &amp; PHSX 206N</td>
<td>College Physics I and College Physics I Laboratory</td>
</tr>
<tr>
<td>PHSX 207N &amp; PHSX 208N</td>
<td>College Physics II and College Physics II Laboratory</td>
</tr>
</tbody>
</table>

**Calculus-based:**

<table>
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</thead>
<tbody>
<tr>
<td>PHSX 215N &amp; PHSX 216N</td>
<td>Fund of Physics w/Calc I and Physics Laboratory I w/Calc</td>
</tr>
<tr>
<td>PHSX 217N &amp; PHSX 218N</td>
<td>Fund of Physics w/Calc II and Physics Laboratory II w/Calc</td>
</tr>
</tbody>
</table>

**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-

### Complete UD Writing Course

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<tbody>
<tr>
<td>BIOH 462</td>
<td>Principles Medical Physiology</td>
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</table>
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.

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Minimum Required Grade: C-