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 Pnclps of Living Systems Lab 1

BIOB 170N Principles Biological Diversity 3

BIOB 171N Principles Biological Dvrsity 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

BIOE 403 Vert Design & Evolution

BIOE 406 Behavior & Evolution

BIOH 462 Principles Medical Physiology

BIOL 435 Comparative Animal Physiology
BIOM 402  Medical Bacteriology & Mycology
BIOM 410  Microbial Genetics
BIOM 427 & BIOM 428  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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<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:**

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
BIOI 484  Plant Evolution  3
BIM 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
BIOI 411  Exprmntl Microbial Genetcs Lab  1
BIOI 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.

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Total Hours 4

Minimum Required Grade: C-