

# 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	Prncpls Biological Diversity	3
BIOB 171N	Prncpls 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	General Microbiology	
& BIOM 361	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 and 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 or M 171	Applied Calculus Calculus I	4
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 & CHMY 124	Introduction to Organic and Biochemistry 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 & CHMY 222	Organic Chemistry I and Organic Chemistry I Lab	
CHMY 223 & CHMY 224	Organic Chemistry II 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 & PHSX 206N	College Physics I and College Physics I Laboratory	
PHSX 207N & PHSX 208N	College Physics II and College Physics II Laboratory	

Calculus-based:

PHSX 215N & PHSX 216N	Fund of Physics w/Calc I and Physics Laboratory I w/Calc	
PHSX 217N & PHSX 218N	Fund of Physics w/Calc II 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
BIOM 411	Exprmntl Microbial Genetcs Lab	1
BIOM 499	Undergraduate Thesis	3-6

Minimum Required Grade: C-

### Complete UD Writing Course

BIOH 462	Principles Medical Physiology	3
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## 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.

M 162	Applied Calculus	4
or M 171	Calculus I	
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Total Hours		4

Minimum Required Grade: C-