

# BIOLOGY B.S. - FIELD ECOLOGY

## Bachelor of Science - Biology; Field Ecology Concentration

### 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

Code	Title	Hours
	Biology/Microbiology Lower-Division Core	17
	Upper-Division Core Courses Required for the Field Ecology Concentration	5
	Additional Upper Division Major Courses Required for the Field Ecology Concentration	8
	Evolution Course Requirement	
	-Ology Course Requirement	
	Ecology Requirement at the Flathead Lake Biological Station	13
	Aquatic Emphasis	
	Terrestrial Emphasis	
	Required Courses Outside of the Major	28-42
	Mathematics - Calculus	
	Mathematics - Statistics	
	Chemistry	
	Physics	
	Advanced College Writing Requirement	
<b>Total Hours</b>		<b>71-85</b>

**Degree Specific Credits:** 71-84

**Required Cumulative GPA:** 2.0

**Note:** The Field Ecology Concentration is for students interested in field-based ecology. Students with this concentration spend one or two summers taking field courses at the Flathead Lake Biological Station (<http://flbs.umt.edu/>). This concentration is a graduate prep program, and is for students interested in academia or employment at a governmental, private, or non-profit agency.

### Biology/Microbiology Lower-Division Core

**Note:** The lower-division core should be completed before attempting most upper-division major courses. AP Biology credit with a score of 3 may be substituted for either BIOB 160N/BIOB 161N or BIOB 170N/BIOB 171N.

Code	Title	Hours
<b>Complete all of the following courses:</b>		
BIOB 160N	Principles of Living Systems	3
BIOB 161N	Principles of Living Systems Lab	1
BIOB 170N	Principles of Biological Diversity	3

BIOB 171N	Principles of Biological Diversity Lab	2
BIOB 260	Cellular and Molecular Biology	4
BIOB 272	Genetics and Evolution	4
<b>Total Hours</b>		<b>17</b>

Minimum Required Grade: C-

### Upper-Division Core Courses Required for the Field Ecology Concentration

Code	Title	Hours
<b>Complete one of the following courses:</b>		
BIOE 342	Field Ecology (at Flathead Lake Biological Station)	5
BIOE 370 & BIOE 371	General Ecology and General Ecology Lab (equivalent to 271)	
<b>Total Hours</b>		<b>5</b>

Minimum Required Grade: C-

### Additional Upper-Division Major Courses Required for the Field Ecology Concentration

**Rule:** Complete a minimum of 8 credits of upper-division Biology or Microbiology (BIOB, BIOE, BIOH, BIOL, BIOM, or BIOO), with at least one course from each of the following subcategories. 8 total credits required.

#### Evolution Course Requirement

Code	Title	Hours
<b>Complete at least one evolutionary biology course from the following list:</b>		
BIOB 480	Conservation Genetics	
BIOB 483	Phylogenics and Evolution	
BIOB 486	Genomics	
BIOE 406	Behavior & Evolution	
BIOE 485	Plant Evolution	
BIOM 420	Host-Microbe Interactions	
<b>Total Hours</b>		<b>3</b>

Minimum Required Grade: C-

#### -Ology Course Requirement

Code	Title	Hours
<b>Complete one of the following courses:</b>		
BIOM 360 & BIOM 361	General Microbiology and General Microbiology Lab (equiv to 260)	3-5
BIOM 427 & BIOM 428	General Parasitology and General Parasitology Lab	
BIOO 320	General Botany	
BIOO 335	Rocky Mountain Flora	
BIOO 340	Biology and Management of Fishes	
BIOO 462	Entomology	
BIOO 470	Ornithology	

BIOO 475	Mammalogy	
<b>Total Hours</b>		<b>3-5</b>

Minimum Required Grade: C-

## Ecology Requirement at the Flathead Lake Biological Station

**Rule:** Complete either the Aquatic Emphasis or the Terrestrial Emphasis.

### Aquatic Emphasis

Code	Title	Hours
<b>If choosing the Aquatic Emphasis:</b>		
<b>Complete all of the following courses:</b>		
BIOE 440	Conservation Ecology	3
BIOE 451	Landscape Ecology	3
BIOB 494	Seminar in Biology	1
<b>Complete 2 of the following courses:</b>		
BIOE 400	Aquatic Microbial Ecology	6
BIOE 439	Stream Ecology	
BIOE 453	Lake Ecology	
<b>Total Hours</b>		<b>13</b>

Minimum Required Grade: C-

### Terrestrial Emphasis

Code	Title	Hours
<b>If choosing the Terrestrial Emphasis:</b>		
<b>Complete all of the following courses:</b>		
BIOE 416	Alpine Ecology	3
BIOE 440	Conservation Ecology	3
BIOE 451	Landscape Ecology	3
BIOE 458	Forest and Fire Ecology	3
BIOB 494	Seminar in Biology	1
<b>Total Hours</b>		<b>13</b>

Minimum Required Grade: C-

## Required Courses Outside of the Major

### Mathematics - Calculus

Code	Title	Hours
<b>Complete one of the following courses:</b>		
M 162	Applied Calculus	4
M 171	Calculus I	
<b>Total Hours</b>		<b>4</b>

Minimum Required Grade: C-

### Mathematics - Statistics

Code	Title	Hours
<b>Complete either one semester or a full year of statistics from the following:</b>		
<b>One Semester:</b>		
STAT 216	Introduction to Statistics	4-8
<b>Full Year:</b>		

STAT 451	Statistical Methods I	
& STAT 452	and Statistical Methods II	
STAT 457	Computer Data Analysis I	
& STAT 458	and Computer Data Analysis II	
<b>Total Hours</b>		<b>4-8</b>

Minimum Required Grade: C-

## Chemistry

### Notes:

- Students who begin in the advanced chemistry sequence may substitute those courses for introductory sequence courses at the discretion of the major advisor.

Code	Title	Hours
<b>Complete a sequence of general and organic chemistry:</b>		
<b>Introductory Chemistry (10 credits):</b>		
CHMY 121N	Introduction to General Chemistry	
CHMY 123	Introduction to Organic and Biochemistry	
& CHMY 124	and Introduction to Organic and Biochemistry Lab	
<b>Advanced Chemistry (20 credits):</b>		
CHMY 141N	College Chemistry I	
& CHMY 142N	and College Chemistry I Lab	
CHMY 143N	College Chemistry II	
& CHMY 144N	and 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	
<b>Total Hours</b>		<b>10-20</b>

Minimum Required Grade: C-

## Physics

Code	Title	Hours
<b>Complete one of the following Physics sequences:</b>		
<b>Algebra- and Trigonometry-based Physics:</b>		
PHSX 205N	College Physics I	
& PHSX 206N	and College Physics I Laboratory	
PHSX 207N	College Physics II	
& PHSX 208N	and College Physics II Laboratory	
<b>Calculus-based Physics:</b>		
PHSX 215N	Fundamentals of Physics with Calculus I	
& PHSX 216N	and Physics Laboratory I with Calculus	
PHSX 217N	Fundamentals of Physics with Calculus II	
& PHSX 218N	and Physics Laboratory II with Calculus (require M 171 and M 172)	
<b>Total Hours</b>		<b>10</b>

Minimum Required Grade: C-

## Advanced College Writing Requirement

**Rule:** To complete 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 Field Ecology concentration requires

BIOE 371 or BIOE 342 (both 2/3 writing courses). The Advanced College Writing Requirement is completed with one additional course, chosen from any of the following.

### 1/3 Advanced Writing Courses

Code	Title	Hours
BCH 482	Advanced Biochemistry II	3
BIOB 410	Immunology	3
BIOB 425	Advanced Cellular & Molecular Biology	3
BIOB 483	Phylogenics and Evolution	3
BIOE 403	Comparative Vertebrate Anatomy	4
BIOE 409	Behavior & Evolution Discussion	1
BIOE 428	Freshwater Ecology	5
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

Code	Title	Hours
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	General Ecology Lab (equivalent to 271)	2
BIOM 411	Experimental Microbial Genetics Lab	1
BIOM 499	Undergraduate Thesis	3-6

Minimum Required Grade: C-

### Complete Advanced Writing Course

Code	Title	Hours
BIOH 462	Principles of Medical Physiology	3
BIOM 420	Host-Microbe Interactions	3

Minimum Required Grade: C-

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