BIOLOGY - FIELD ECOLOGY

Bachelor of Science - Biology; Field Ecology Concentration

College Humanities & Sciences

Degree Specific Credits: 69

Required Cumulative GPA: 2.0

Catalog Year: 2017-2018

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.

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 for the Field Ecology Concentration 5
Additional Upper Division Major Courses Required for the Field Ecology Concentration 8
Field Ecology Concentration

- 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 26-42

Chemistry
Physics
Upper Division Writing Expectations for the Major 8-13

Total Hours 77-98

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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOB 160N</td>
<td>Principles of Living Systems</td>
<td>3</td>
</tr>
<tr>
<td>BIOB 161N</td>
<td>Prncpls of Living Systems Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOB 170N</td>
<td>Principls Biological Diversity</td>
<td>3</td>
</tr>
<tr>
<td>BIOB 171N</td>
<td>Prncpls Biological Dvrsty Lab</td>
<td>2</td>
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<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOB 260</td>
<td>Cellular and Molecular Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOB 272</td>
<td>Genetics and Evolution</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours 17

Minimum Required Grade: C-

Upper Division Core Courses Required for the Field Ecology Concentration

Select one of the following: 5

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOE 342</td>
<td>Field Ecology (at Flathead Lake Biological Station)</td>
<td>1</td>
</tr>
<tr>
<td>BIOE 370</td>
<td>General Ecology</td>
<td>1</td>
</tr>
<tr>
<td>&amp; BIOE 371</td>
<td>General Ecology Lab (equiv to 271)</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Hours 5

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, with at least one course from each subcategory

Minimum Required Grade: C-

8 Total Credits Required

Evolution Course Requirement

Rule: Complete at least one evolutionary biology course from the following list

Select at least one of the following: 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOB 480</td>
<td>Conservation Genetics</td>
<td>1</td>
</tr>
<tr>
<td>BIOB 483</td>
<td>Phylogenics and Evolution</td>
<td>1</td>
</tr>
<tr>
<td>BIOB 486</td>
<td>Genomics</td>
<td>1</td>
</tr>
<tr>
<td>BIOE 406</td>
<td>Behavior &amp; Evolution</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 484</td>
<td>Plant Evolution</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Hours 3

Minimum Required Grade: C-

-Ology Course Requirement

Select at least one of the following: 3-5

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOM 360</td>
<td>General Microbiology</td>
<td>1</td>
</tr>
<tr>
<td>&amp; BIOM 361</td>
<td>General Microbiology Lab (equiv to 260)</td>
<td>1</td>
</tr>
<tr>
<td>BIOM 427</td>
<td>General Parasitology</td>
<td>1</td>
</tr>
<tr>
<td>&amp; BIOM 428</td>
<td>General Parasitology Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOO 320</td>
<td>General Botany</td>
<td>1</td>
</tr>
<tr>
<td>BIOO 335</td>
<td>Rocky Mountain Flora</td>
<td>1</td>
</tr>
<tr>
<td>BIOO 340</td>
<td>Biology and Mgmt of Fishes</td>
<td>1</td>
</tr>
<tr>
<td>BIOO 462</td>
<td>Entomology</td>
<td>1</td>
</tr>
<tr>
<td>BIOO 470</td>
<td>Ornithology</td>
<td>1</td>
</tr>
<tr>
<td>BIOO 475</td>
<td>Mammalogy</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Hours 3-5

Minimum Required Grade: C-
Biology - Field Ecology

Ecology Requirement at the Flathead Lake Biological Station

Rule: Complete either the Aquatic Emphasis or the Terrestrial Emphasis

Minimum Required Grade: C-

Aquatic Emphasis

Rule: All of the following courses are required for the Aquatic Emphasis

- BIOE 439 Stream Ecology 3
- BIOE 440 Conservation Ecology 3
- BIOE 451 Landscape Ecology 3
- BIOE 453 Ecology of Small & Large Lakes 3
- BIOL 492 Seminars in Ecol & Res Man 1

Total Hours 13

Minimum Required Grade: C-

Terrestrial Emphasis

Rule: All of the following courses are required for the Terrestrial Emphasis

- BIOE 416 Alpine Ecology 3
- BIOE 440 Conservation Ecology 3
- BIOE 451 Landscape Ecology 3
- BIOE 458 Forest and Grassland Ecol 3
- BIOL 492 Seminars in Ecol & Res Man 1

Total Hours 13

Minimum Required Grade: C-

Required Courses Outside of the Major

Minimum Required Grade: C-

Mathematics - Calculus

Rule: Required

- M 162 Applied Calculus 4
- or M 171 Calculus I 4

Total Hours 4

Minimum Required Grade: C-

Mathematics - Statistics

Select either one semester or a full year of statistics from the following:

One Semester:

- STAT 216 Introduction to Statistics 4-8

Full Year:

- STAT 451 Statistical Methods I & STAT 452 Statistical Methods II
- STAT 457 Computer Data Analysis I & STAT 458 Computer Data Analysis II

Total Hours 4-8

Minimum Required Grade: C-

Chemistry

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

One Year:

- CHMY 121N Introduction to General Chemistry
- CHMY 123 & CHMY 124 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 Organic Chemistry I Lab
- CHMY 223 Organic Chemistry II
- CHMY 224 Organic Chemistry II Lab

Total Hours 8-20

Minimum Required Grade: C-

Physics

Select one of the following physics sequences:

10

Algebra- and Trigonometry-based:

- PHSX 205N & PHSX 206N College Physics I & College Physics I Laboratory
- PHSX 207N & PHSX 208N College Physics II & College Physics II Laboratory

Calculus-based:

- PHSX 215N & PHSX 216N Fund of Physics w/Calc I & Physics Laboratory I w/Calc
- PHSX 217N & PHSX 218N Fund of Physics w/Calc II & 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 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.

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
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOE 409</td>
<td>Behavior &amp; Evolution Discussion</td>
<td>1</td>
</tr>
<tr>
<td>BIOE 428</td>
<td>Freshwater Ecology</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 484</td>
<td>Plant Evolution</td>
<td>3</td>
</tr>
<tr>
<td>BIOM 402</td>
<td>Medical Bacteriology &amp; Mycology</td>
<td>3</td>
</tr>
<tr>
<td>BIOO 320</td>
<td>General Botany</td>
<td>5</td>
</tr>
<tr>
<td>BIOO 434</td>
<td>Plant Physiology Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOO 470</td>
<td>Ornithology</td>
<td>4</td>
</tr>
<tr>
<td>BIOO 475</td>
<td>Mammalogy</td>
<td>4</td>
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</table>

Minimum Required Grade: C-

### 2/3 Advanced Writing Courses

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<tr>
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<th>Course Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BCH 486</td>
<td>Biochemistry Research Lab</td>
<td>3</td>
</tr>
<tr>
<td>BCH 499</td>
<td>Senior Thesis/Capstone</td>
<td>3-6</td>
</tr>
<tr>
<td>BIOB 411</td>
<td>Immunology Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>BIOB 499</td>
<td>Undergraduate Thesis</td>
<td>3-6</td>
</tr>
<tr>
<td>BIOE 342</td>
<td>Field Ecology</td>
<td>5</td>
</tr>
<tr>
<td>BIOE 371</td>
<td>Gen Ecology Lab (equiv to 271)</td>
<td>2</td>
</tr>
<tr>
<td>BIOM 411</td>
<td>Exprmntl Microbial Genetics Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOM 499</td>
<td>Undergraduate Thesis</td>
<td>3-6</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

### Complete Advanced Writing Course

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOH 462</td>
<td>Principles Medical Physiology</td>
<td>3</td>
</tr>
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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.

- M 162: Applied Calculus
- M 171: Calculus I

Total Hours: 4

Minimum Required Grade: C-