TERRESTRIAL ECOSYSTEM SCIENCE AND RESTORATION

The major in Ecosystem Science and Restoration prepares students to understand how ecosystems work to solve pressing environmental problems or help restore degraded ecosystems. Students can select one of two options:

• the terrestrial concentration, which focuses on the understanding and repair of terrestrial ecosystems; and
• the aquatic concentration, which focuses on aquatic ecosystem function and watershed restoration.

Students engage in field-based learning, contribute to cutting-edge restoration or ecosystem science projects, and are challenged to apply ecological theory to restoration practice. The major requires completion of a nine-credit restoration capstone, during which students gain hands-on real-world experience planning and implementing restoration projects in partnership with natural resource management agencies and organizations in western Montana.

A degree in Ecosystem Science and Restoration prepares students for careers as ecologists or restoration practitioners with non-profit, private, or governmental agencies and for graduate school in ecology or natural resource management. Students who graduate with this major may qualify for the following federal civil service jobs:

• biological technician (Series 0404),
• ecologist (Series GS-408),
• forester (Series G-460),
• hydrologist (Series GS-1315) and
• soil conservationist (Series GS-457).


Bachelor of Science - Ecosystem Science & Restoration; Terrestrial Concentration

W.A Franke College of Forestry & Conservation

Degree Specific Credits: 88

Required Cumulative GPA: 2.0

Catalog Year: 2017-2018

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

<table>
<thead>
<tr>
<th>Major Required Courses</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside Major Required Courses</td>
<td>34-35</td>
</tr>
</tbody>
</table>

**Major Required Courses**

Must take all courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRSM 121S or NRSM 170</td>
<td>Nature of Montana or International Envir. Change</td>
</tr>
<tr>
<td>NRSM 200</td>
<td>Nat. Resource Professional Wrtg</td>
</tr>
<tr>
<td>NRSM 210N</td>
<td>Soils, Water and Climate</td>
</tr>
<tr>
<td>NRSM 265</td>
<td>Elements of Ecological Restora</td>
</tr>
</tbody>
</table>

Total Hours: 12

Minimum Required Grade: C-

**Outside Major Required Courses**

Must take all courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOB 160N</td>
<td>Principles of Living Systems</td>
</tr>
<tr>
<td>BIOB 161N</td>
<td>Pmcpls of Living Systems Lab</td>
</tr>
<tr>
<td>BIOB 260</td>
<td>Cellular and Molecular Biology</td>
</tr>
<tr>
<td>BIOB 272</td>
<td>Genetics and Evolution</td>
</tr>
<tr>
<td>BIOO 105N</td>
<td>Introduction to Botany</td>
</tr>
<tr>
<td>CHMY 121N</td>
<td>Introduction to General Chemistry</td>
</tr>
<tr>
<td>CHMY 123</td>
<td>Introduction to Organic and Biochemistry</td>
</tr>
<tr>
<td>COMX 111A or THTR 120A</td>
<td>Intro to Public Speaking or Introduction to Acting I</td>
</tr>
<tr>
<td>M 162</td>
<td>Applied Calculus</td>
</tr>
<tr>
<td>WRIT 101</td>
<td>College Writing I</td>
</tr>
</tbody>
</table>

Select one of the following: 3-4

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 216</td>
<td>Introduction to Statistics</td>
</tr>
<tr>
<td>FORS 201</td>
<td>Forest Biometrics</td>
</tr>
<tr>
<td>WILD 240</td>
<td>Intro to Biostatistics</td>
</tr>
</tbody>
</table>

Total Hours: 34-35

Minimum Required Grade: C-

**Major Required Courses**

Must take all courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRSM 344</td>
<td>Ecosystem Science and Restoration Capstone</td>
</tr>
</tbody>
</table>

Total Hours: 5
### Outside Major Required Courses

**Note:** Can take BIOE 448 OR FORS 330 OR NRSM 462

- **NRSM 385:** Watershed Hydrology 3
- **NRSM 389E:** Ethics Forestry & Conservation 3
- **or NRSM 449E:** Climate Change Ethics/Policy
- **NRSM 422:** Nat Res Policy/Administration 3
- **NRSM 465:** Foundations of Restoration Ecology 3
- **or BIOE 447:** Terrestrial Ecosystem Ecology
- **NRSM 494:** Ecosystem Science and Restoration Seminar 1
- **NRSM 495:** Ecosystem Science and Restoration Practicum 1-6

**Total Hours:** 19-24

Minimum Required Grade: C-

### Restoration Terrestrial Electives

**Note:** No Double Dipping with CORE courses

Select at least 9 credits from the following: 9

- **BIOE 342:** Field Ecology
- **BIOE 416:** Alpine Ecology
- **BIOE 447:** Terrestrial Ecosystem Ecology
- **BIOE 448:** Terrestrial Plant Ecology
- **BIOE 451:** Landscape Ecology
- **BIOE 458:** Forest and Grassland Ecol
- **BIOO 320:** General Botany
- **BIOO 433:** Plant Physiology
- **FORS 202:** Forest Mensuration
- **FORS 250:** Intro to GIS for Forest Mgt
- **FORS 330:** Forest Ecology
- **FORS 331:** Wildland Fuel Management
- **FORS 333:** Fire Ecology
- **FORS 347:** Multiple Resource Silviculture
- **GEO 318:** Climate System Dynamics
- **NRSM 360:** Rangeland Mgt (equiv 260)
- **NRSM 408:** Global Cycles and Climate
- **NRSM 415:** Environmental Soil Science
- **NRSM 418:** Ecosystem Climatology
- **NRSM 465:** Foundations of Restoration Ecology
- **NRSM 462:** Rangeland Ecology
- **WILD 470:** Consrv of Wildlife Populatns

**Total Hours:** 9

Minimum Required Grade: C-

### Restoration Social Science Elective Courses

Select at least one of the following: 3

- **ECNS 433:** Economics of the Environment
- **FORS 320:** Forest Environmental Economics
- **NRSM 379:** Collab in Nat Res Decisions
- **NRSM 426:** Climate and Society
- **NRSM 475:** Environment & Development

**Total Hours:** 3

Minimum Required Grade: C-

### Writing Required for the Major

**Rule:** Must complete the following subcategories

#### Lower Division Writing

- **NRSM 200:** Nat. Resource Professional Wrtg 3

**Total Hours:** 3

Minimum Required Grade: C-

#### Upper Division Writing

Select at least three of the following: 9

- **BIOE 428:** Freshwater Ecology
- **FORS 330:** Forest Ecology
- **NRSM 344:** Ecosystem Science and Restoration Capstone
- **NRSM 379:** Collab in Nat Res Decisions
- **NRSM 495:** Ecosystem Science and Restoration Practicum
- **NRSM 499:** Senior Thesis

**Total Hours:** 9

Minimum Required Grade: C-

### Math Requirement for Major

**Rule:** Must take all courses

- **M 162:** Applied Calculus 4

**Total Hours:** 4

Minimum Required Grade: C-

### Exception to the Modern/Classical Languages Requirement

**Rule:** The Ecosystem Science and Restoration major has been granted an exception to the Modern/Classical Language Requirement. Must take one of the following courses to satisfy this requirement.

Select one of the following: 3-4

- **FORS 201:** Forest Biometrics
- **STAT 216:** Introduction to Statistics
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WILD 240</td>
<td>Intro to Biostatistics</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

**Expressive Arts Requirement for Major**

**Rule:** must take one of the following courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMX 111A</td>
<td>Intro to Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>or THTR 120A</td>
<td>Introduction to Acting I</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 3

Minimum Required Grade: C-

**Social Sciences**

**Rule:** May take the below course

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRSM 121S</td>
<td>Nature of Montana</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours 3

Minimum Required Grade: C-

**Ethical & Human Values Elective within Major**

**Rule:** must take one of the following courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRSM 449E</td>
<td>Climate Change Ethics/Policy</td>
<td>3</td>
</tr>
<tr>
<td>or NRSM 389E</td>
<td>Ethics Forestry &amp; Conservation</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 3

Minimum Required Grade: C-

**Natural Sciences within Major**

**Rule:** Must take all courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</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>CHMY 121N</td>
<td>Introduction to General Chemistry</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours 7

Minimum Required Grade: C-