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

| Major Required Courses | 12 |
| Outside Major Required Courses | 34:35 |

Major Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRSM 121S</td>
<td>Nature of Montana</td>
</tr>
<tr>
<td>or NRSM 170</td>
<td>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: 124:131

Minimum Required Grade: C-

Outside Major Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOB 161N</td>
<td>Principles of Living Systems</td>
</tr>
<tr>
<td>BIOL 260</td>
<td>Cellular and Molecular Biology</td>
</tr>
<tr>
<td>BIOL 272</td>
<td>Genetics and Evolution</td>
</tr>
<tr>
<td>BIOC 299</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>CMNX 111A</td>
<td>Intro to Public Speaking</td>
</tr>
<tr>
<td>or THTR 120A</td>
<td>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

<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
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-

Outside Major Required Courses

Note: Can take BIOE 448 OR FORS 330 OR NRSM 462
Must take all courses
BIOE 370 General Ecology 3
BIOO 335 Rocky Mountain Flora 3
Total Hours 6

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 Conserv 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 will satisfy this requirement.

Select one of the following: 3-4
FORS 201 Forest Biometrics
STAT 216 Introduction to Statistics
WILD 240  Intro to Biostatistics

Total Hours  3-4

Minimum Required Grade: C-

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**Expressive Arts Requirement for Major**

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

<table>
<thead>
<tr>
<th>Course</th>
<th>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-

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**Social Sciences**

**Rule:** May take the below course

<table>
<thead>
<tr>
<th>Course</th>
<th>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-

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**Ethical & Human Values Elective within Major**

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

<table>
<thead>
<tr>
<th>Course</th>
<th>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-

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**Natural Sciences within Major**

**Rule:** Must take all courses

<table>
<thead>
<tr>
<th>Course</th>
<th>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>Princpls 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-