

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).

More information on federal civil service requirements can be found at (<https://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-standards/#url=List-by-Title>): <https://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-standards/#url=List-by-Title>.

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.umn.edu/academics/general-education-requirements>) of the catalog.

Summary

Major Required Courses	12
Outside Major Required Courses	34-35

Major Required Courses	19-24
Outside Major Required Courses	9
Restoration Terrestrial Electives	9
Restoration Social Science Elective Courses	3
Writing Required for the Major	15
Lower Division Writing	
Upper Division Writing	
Math Requirement for Major	4
Exception to the Modern/Classical Languages Requirement	3-4
Expressive Arts Requirement for Major	3
Social Sciences	3
Ethical & Human Values Elective within Major	3
Natural Sciences within Major	7
Total Hours	124-131

Major Required Courses

Must take all courses

NRSM 121S	Nature of Montana	3
or NRSM 170	International Envir. Change	
NRSM 200	Nat.Resource Professional Wrtg	3
NRSM 210N	Soils, Water and Climate	3
NRSM 265	Elements of Ecological Restora	3
Total Hours		12

Minimum Required Grade: C-

Outside Major Required Courses

Must take all courses

BIOB 160N	Principles of Living Systems	3
BIOB 161N	Prncpls of Living Systems Lab	1
BIOB 260	Cellular and Molecular Biology	4
BIOB 272	Genetics and Evolution	4
BIOO 105N	Introduction to Botany	3
CHMY 121N	Introduction to General Chemistry	3
CHMY 123	Introduction to Organic and Biochemistry	3
COMX 111A	Intro to Public Speaking	3
or THTR 120A	Introduction to Acting I	
M 162	Applied Calculus	4
WRIT 101	College Writing I	3
Select one of the following:		3-4
STAT 216	Introduction to Statistics	
FORS 201	Forest Biometrics	
WILD 240	Intro to Biostatistics	
Total Hours		34-35

Minimum Required Grade: C-

Major Required Courses

Must take all courses

NRSM 344	Ecosystem Science and Restoration Capstone	5
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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-

Expressive Arts Requirement for Major

Rule: must take one of the following courses

COMX 111A	Intro to Public Speaking	3
or THTR 120A	Introduction to Acting I	
Total Hours		3

Minimum Required Grade: C-

Social Sciences

Rule: May take the below course

NRSM 121S	Nature of Montana	3
Total Hours		3

Minimum Required Grade: C-

Ethical & Human Values Elective within Major

Rule: must take one of the following courses

NRSM 449E	Climate Change Ethics/Policy	3
or NRSM 389E	Ethics Forestry & Conservation	
Total Hours		3

Minimum Required Grade: C-

Natural Sciences within Major

Rule: Must take all courses

BIOB 160N	Principles of Living Systems	3
BIOB 161N	Prncpls of Living Systems Lab	1
CHMY 121N	Introduction to General Chemistry	3
Total Hours		7

Minimum Required Grade: C-