

AQUATIC 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 (<http://www.opm.gov/qualifications/standards/indexes/alph-ndx.asp>) can be found at: <http://www.opm.gov/qualifications/standards/indexes/alph-ndx.asp>.

Bachelor of Science - Ecosystem Science & Restoration; Aquatic Concentration

W.A Franke College of Forestry & Conservation

Degree Specific Credits: 89

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	9
Outside Major Required Courses	39-40
Major Required Courses	21

Outside Major Required Courses	8
Restoration Aquatic Electives	9
Social Science Elective Courses	3
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Expressive Arts Requirement for Major	3
Social Science	3
Ethical & Human Values Elective within Major	3
Natural Sciences within Major	7
Total Hours	131-133

Major Required Courses

Rule: Must take all courses

NRSM 121S	Nature of Montana	3
or NRSM 170	International Envir. Change	
NRSM 200	Nat.Resource Professional Wrtg	3
NRSM 265	Elements of Ecological Restora	3
Total Hours		9

Minimum Required Grade: C-

Outside Major Required Courses

Rule: 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
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	
GEO 101N	Introduction to Physical Geology	3
GEO 102N	Introduction to Physical Geology Lab	1
M 171	Calculus I	4
M 172	Calculus II	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		39-40

Minimum Required Grade: C-

Major Required Courses

Rule: Must take all courses

NRSM 344	Ecosystem Science and Restoration Capstone	5
NRSM 385	Watershed Hydrology	3
NRSM 422	Nat Res Policy/Administration	3

NRSM 465 or BIOE 447	Foundations of Restoration Ecology Terrestrial Ecosystem Ecology	3
NRSM 389E	Ethics Forestry & Conservation	3
NRSM 494	Ecosystem Science and Restoration Seminar	1
NRSM 495	Ecosystem Science and Restoration Practicum	3
Total Hours		21

Minimum Required Grade: C-

Outside Major Required Courses

Rule: Must take all courses

BIOE 370	General Ecology	3
BIOE 428	Freshwater Ecology	5
Total Hours		8

Minimum Required Grade: C-

Restoration Aquatic Electives

Select at least 9 credits from the following: 9

BIOE 342	Field Ecology	
BIOE 439	Stream Ecology	
BIOE 451	Landscape Ecology	
BIOE 447	Terrestrial Ecosystem Ecology	
BIOE 453	Ecology of Small & Large Lakes	
BIOO 340	Biology and Mgmt of Fishes	
FORS 250	Intro to GIS for Forest Mgt	
GEO 318	Climate System Dynamics	
GEO 420	Hydrogeology	
GEO 421	Hydrology	
GEO 460	Process Geomorphology	
NRSM 210N	Soils, Water and Climate	
NRSM 408	Global Cycles and Climate	
NRSM 418	Ecosystem Climatology	
NRSM 455	Riparian Ecology & Management	
NRSM 465	Foundations of Restoration Ecology	
WILD 485	Aquatic Invertebrate Ecology	
Total Hours		9

Minimum Required Grade: C-

Social Science Elective Courses

Rule: must take at least 3 credits

Select at least one of the following: 3

ECNS 433	Economics of the Environment	
FORS 320	Forest Environmental Economics	
GPHY 335	Water Policy	
NRSM 379	Collab in Nat Res Decisions	
NRSM 426	Climate and Society	

NRSM 475	Environment & Development	
Total Hours		3

Minimum Required Grade: C-

Writing Requirements

Rule: Must complete the following subcategories

Lower Division Writing

Rule: Complete all courses

NRSM 200	Nat.Resource Professional Wrtg	3
Total Hours		3

Minimum Required Grade: C-

Upper Division Writing

Rule: Must take at least three courses

Select at least 9 credits from 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 Requirements for Major

Rule: Must take all courses

M 171	Calculus I	4
M 172	Calculus II	4
Total Hours		8

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	
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Total Hours		3

Minimum Required Grade: C-

Social Science

Rule: May take the following course

NRSM 121S	Nature of Montana	3
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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	
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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
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Total Hours		7

Minimum Required Grade: C-