

Natural Resources Management

Natural Resources Management

With increasing human pressure and a growing need to balance competing demands, our world needs new and better ways to manage society's impacts on the environment. The Natural Resources Management program prepares students for challenging careers requiring the sustainability perspective and global social perspective necessary for examining and solving complex natural resources management problems. Our goal is the highest and best societal uses of natural resources while maintaining the integrity of life-sustaining socio-ecological systems. Career opportunities abound in federal, state and local government, the private sector, non-profit conservation and environmental organizations, as well as higher education and research.

An interdisciplinary major in NRM leads to a Bachelor of Science (B.S.) degree. Students benefit from faculty engagement from the various colleges across the university in the coordination of the program, classroom teaching and advising.

During the first four semesters of the NRM program, students complete a broad foundation of core courses in the social, biological, and physical sciences. The second half of the program offers students the opportunity to focus on a specific area of interest (emphasis). NRM offers six emphasis areas, each allowing students the flexibility to select courses for specialized career preparation.

- **Biotic Resources Science:** deals with basic scientific principles that govern the interrelationship between biotic (e.g., plants, animals) and abiotic factors (e.g., climate, soils) in major ecosystems and the use of these principles for environmentally sound management of both natural and agro-ecosystems.
- **Environmental Communication:** is designed for environmentally oriented students preparing for careers in communication fields such as journalism, public relations, broadcast media and the internet.
- **Natural Resources Economics:** prepares students for management, administrative, regulatory, and policy positions that require a broad understanding of natural resources management and allocation.
- **Physical/Earth Resources Science:** leads to an understanding of the physical and chemical aspects of ecosystems. Topics of study include hydrology, water management and quality, waste management, soil properties, energy resources and land-use management.
- **Pollution Control:** focuses on the principles and practices of managing natural resources for pollution control. Topics include the technical aspects of pollution as they relate to water, air/solids, earth/soils, and the impact of environmental pollution on biotic factors. Students interested in this emphasis are strongly urged to complete College Algebra before entering the NRM program.
- **Social Sciences:** concentrates on human factors (social, political, anthropological) in environmental management and environmental disaster management, while recognizing constraints and opportunities presented by physical and biological factors.

Major Requirements

Major: Natural Resources Management

Degree Type: B.S.

Required Degree Credits to Graduate: 128

General Education Requirements

First Year Experience (F):

AGRI 189	Skills for Academic Success (Students transferring in 24 or more credits do not need to take AGRI 189.)	1
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Communication (C):

ENGL 110	College Composition I	3
ENGL 120	College Composition II	3
One Course in Upper Level Writing: Select one of the following:		3

ENGL 320 Business and Professional Writing

ENGL 321 Writing in the Technical Professions

ENGL 324 Writing in the Sciences

ENGL 358 Writing in the Humanities and Social Sciences

COMM 110	Fundamentals of Public Speaking	3
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Quantitative Reasoning (R):

STAT 330	Introductory Statistics	3
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Science & Technology (S):

CHEM 121 & 121L	General Chemistry I and General Chemistry I Laboratory	4
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GEOL 105	Physical Geology	3
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NRM 225	Natural Resources & Agrosystems	3
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Humanities & Fine Arts (A): Select from current general education list		6
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Social & Behavioral Sciences (B):

ECON 201	Principles of Microeconomics	3
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Select one of the following:		3
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POLS 110 Introduction to Political Science

SOC 110 Introduction to Sociology

EMGT 101 Emergencies, Disasters, and Catastrophes

ANTH 111 Introduction to Anthropology

Wellness (W): Select from current general education list		2
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Cultural Diversity (D): Select from current general education list

Global Perspectives (G):

GEOL 105	Physical Geology	3
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Total Credits		40
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Major Requirements

General Education Requirements		40
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Required Core Courses for Natural Resources Management:

BIOL 150 & 150L	General Biology I and General Biology I Laboratory	4
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BIOL 151 & 151L	General Biology II and General Biology II Laboratory	4
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BIOL 364	General Ecology	3
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ECON 481	Natural Resource Economics	3
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HIST 434	Environmental History	3
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NRM 150	Natural Resource Management Orientation	1
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NRM/SOIL 264	Natural Resource Management Systems	3
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NRM 431	National Environmental Policy Act & Environmental Impact Assessment	3
POLS 115	American Government	3
or POLS 215	Problems and Policies In American Government	
RNG 452	Geographic Information Systems in Range Survey	3
or GEOG 455	Introduction to Geographic Information Systems	
Select one of the following:		3
SOC 431	Environmental Sociology	
POLS 360	Principles of Public Administration	
POLS 422	State and Local Politics	
POLS 442	Global Policy Issues	
ANTH 462	Anthropology and the Environment	
EMGT 261	Disaster Preparedness	
EMGT 262	Disaster Mitigation	
EMGT 263	Disaster Response	
EMGT 264	Disaster Recovery	
SOIL 210	Introduction to Soil Science	
NRM Emphasis Area: Students must select one of the six NRM emphasis areas to complete the major. See below.		38
Degree Requirements: Potential of a minimum of 12 credits to reach 128.		12
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Total Credits		123

Natural Resources Management Emphasis Areas

- Select and complete one emphasis area as part of the Natural Resources Management major.
- Declaring an Emphasis- Students should formally declare an emphasis area with the Office of Registration & Records by the beginning of their junior year. The emphasis area is recorded on the academic transcript with the degree.

Biotic Resources Science

Required. Select two of the following:		6
CHEM 122	General Chemistry II	
CHEM 240	Survey of Organic Chemistry	
RNG 336	Introduction to Range Management	
RNG/NRM 453	Rangeland Resources Watershed Management	
Select a minimum of 32 credits from the approved electives list below for Biotic Resources:		
BOT 314	Plant Systematics	
RNG 456	Range Habitat Management	
SOIL 217	Introduction to Meteorology & Climatology	
NRM 401	Urban-Ecosystem Management	
NRM 420	Scenarios in Natural Resources Management	
PLSC 219	Introduction to Prairie & Community Forestry	
ZOO 470	Limnology	
ZOO 476	Wildlife Ecology and Management	
PLSC/BOT/ ZOO 315	Genetics	
PLSC/BOT/ ZOO 315L	Genetics Laboratory	
RNG/NRM 454	Wetland Resources Management	
BOT/RNG 460	Plant Ecology	

MICR 202	Introductory Microbiology	
ZOO 450	Invertebrate Zoology	
ZOO 454	Herpetology	
ZOO 458	Mammalogy	
PLSC 355	Woody Landscape Plants	
RNG/BOT 450	Range Plants	
BOT 380	Plant Physiology	
RNG 458	Grazing Ecology	
MICR 202L	Introductory Microbiology Lab	
NRM 402	River and Stream Resource Management	
NRM 421	Environmental Outreach Methods	
ZOO 462	Physiological Ecology	
ZOO 475	Conservation Biology	
ZOO 477	Wildlife and Fisheries Management Techniques	
ENT 350	General Entomology	
ZOO 360	Animal Behavior	
ZOO 452	Ichthyology	
ZOO 456	Ornithology	
PLSC 323	Principles of Weed Science	
RNG 326	Modeling of Range and Agro-Ecosystems	
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Total Credits		38

Physical/earth Resources Science

Required:		
CHEM 122 & 122L	General Chemistry II and General Chemistry II Laboratory	4
MATH 146	Applied Calculus I	4
or MATH 165	Calculus I	
GEOL 412	Geomorphology	3
or SOIL 444	Soil Genesis and Survey	
Select a minimum of 27 credits from the approved electives list below for Physical/Earth Resources Science:		27
ABEN 464	Resource Conservation and Irrigation Engineering	
ASM 354	Electricity and Electronic Applications	
RNG 336	Introduction to Range Management	
GEOL 105L	Physical Geology Lab	
GEOL 412	Geomorphology	
SOIL 444	Soil Genesis and Survey	
NRM 401	Urban-Ecosystem Management	
RNG/NRM 454	Wetland Resources Management	
NRM 420	Scenarios in Natural Resources Management	
PHYS 211	College Physics I	
CE 204	Surveying	
SOIL 322	Soil Fertility and Fertilizers	
SOIL 410	Soils and Land Use	
MICR 202	Introductory Microbiology	
SOIL 465	Soil And Plant Analysis	
GEOL/CHEM 428	Geochemistry	
ASM 225	Computer Applications in Agricultural Systems Management	
PHYS 211L	College Physics I Laboratory	

CHEM 240	Survey of Organic Chemistry	
GEOL 300	Environmental Geology	
GEOL 414	Hydrogeology	
MICR 202L	Introductory Microbiology Lab	
NRM 402	River and Stream Resource Management	
NRM 421	Environmental Outreach Methods	
ASM 454	Principles and Application of Precision Agriculture	
SOIL 217	Introduction to Meteorology & Climatology	
SOIL 351	Soil Ecology	
SOIL 433	Soil Physics	
SOIL 447	Microclimatology	
SOIL 480	Soils and Pollution	

Total Credits 38

Environmental Communication

Required:

COMM 112	Understanding Media and Social Change	3
COMM 200	Introduction to Media Writing	3
NRM 421	Environmental Outreach Methods	3
COMM 485	Crisis Communications in Public Relations	3

Select one of the following: 4

COMM/POLS/ Applied Research Methods
CJ 325

SOC 340 Social Research Methods
& SOC 341 and Social Research Methods Laboratory

Select a minimum of 22 credits from the approved electives list below 22
for Environmental Communication:

COMM 260	Principles of Internet Web-Based Design	
COMM 301	Rhetorical Traditions	
COMM 345	Principles of Broadcast Production	
NRM 420	Scenarios in Natural Resources Management	
COMM 433	Legal Communication	
COMM 442	Digital Media and Society	
COMM 445	Advanced Broadcast Production	
COMM 472	Public Relations Campaigns	
COMM 402	Contemporary Rhetoric	
COMM 261	Introduction to Web Development	
COMM 310	Advanced Media Writing	
COMM 362	Principles of Design For Print	
COMM 383	Organizational Communication I	
NRM 421	Environmental Outreach Methods	
COMM 436	Issues in Mass Communications	
COMM 443	Mass Media and Public Opinion	
COMM 450	Issues in Communication	
COMM 431	Communication Ethics	

Total Credits 38

Pollution Control

Required:

CE 309	Fluid Mechanics	3
CE 370	Introduction to Environmental Engineering	3
CE 408	Water Resources and Supply	3

CHEM 122	General Chemistry II	4
& 122L	and General Chemistry II Laboratory	
MATH 165	Calculus I	4
ME 221	Engineering Mechanics I	3
ME 222	Engineering Mechanics II	3

Select a minimum of 15 credits from the approved electives list below 15
for Pollution Control:

Air/Solids:

CE 472	Solid Waste Management	
SOIL 217	Introduction to Meteorology & Climatology	
SOIL 447	Microclimatology	

Biotic:

ABEN 499	Special Topics	
BOT 380	Plant Physiology	

BOT/RNG 460 Plant Ecology

MICR 350	General Microbiology	
MICR 350L	General Microbiology Lab	
ZOO 470	Limnology	
ZOO 476	Wildlife Ecology and Management	
ZOO 477	Wildlife and Fisheries Management Techniques	

Earth/Soils:

CHEM 240	Survey of Organic Chemistry	
GEOL 300	Environmental Geology	
SOIL 322	Soil Fertility and Fertilizers	
SOIL 351	Soil Ecology	
SOIL 410	Soils and Land Use	
SOIL 433	Soil Physics	
SOIL 444	Soil Genesis and Survey	
SOIL 447	Microclimatology	
SOIL 465	Soil And Plant Analysis	
SOIL 480	Soils and Pollution	

Water:

ABEN 464	Resource Conservation and Irrigation Engineering	
CE 410	Water and Wastewater Engineering	
CE 421	Open Channel Flow	
CE 477	Applied Hydrology	
CE 478	Water Quality Management	
GEOL 414	Hydrogeology	
RNG/NRM	Rangeland Resources Watershed Management	
453		
GEOL/CHEM	Geochemistry	
428		

Total Credits 38

Natural Resources Economics

Required:

MATH 146	Applied Calculus I	4
or MATH 165	Calculus I	
ECON 341	Intermediate Microeconomics	3
STAT 331	Regression Analysis	2

Select a minimum of 29 credits from the approved electives list below 29
for Natural Resources Economics:

AGEC 339	Quantitative Methods & Decision Making	
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AGEC 375	Applied Agricultural Law	
ECON 202	Principles of Macroeconomics	
ECON 343	Intermediate Macroeconomics	
ECON 456	History of Economic Thought	
ECON 470	Public Economics	
ECON 480	Industrial Organization	
GEOG 262	Geography of North America	
NRM 401	Urban-Ecosystem Management	
NRM 420	Scenarios in Natural Resources Management	
POLS 220	International Politics	
POLS 442	Global Policy Issues	
POLS 452	Comparative Political Economy	
SOC 403	Sociology of The Great Plains	
SOC 439	Social Change	
AGEC 347	Principles of Real Estate	
AGEC 484	Agricultural Policy	
COMM 315	Small Group Communication	
ECON 324	Money and Banking	
ECON 410	Econometrics	
ECON 461	Economic Development	
ECON 472	International Trade	
HNES 427	Leisure And Society	
NRM 402	River and Stream Resource Management	
NRM 421	Environmental Outreach Methods	
POLS 360	Principles of Public Administration	
POLS 444	International Law	
POLS 453	Environmental Policy and Politics	
SOC 431	Environmental Sociology	
Total Credits		38

Social Sciences

Required:

SOC 340	Social Research Methods	4
& SOC 341	and Social Research Methods Laboratory	
SOC 422	Development Of Social Theory	3
or ANTH 480	Development of Anthropological Theory	

Select a minimum of 31 credits from the approved electives list below for Social Science: 31

ANTH 204	Archaeology and Prehistory	
ANTH 206	Introduction to Cultural Anthropology: Peoples of the World	
ANTH 446	Latin America & Carribean: Afro-Latino/as, Gender, Indigeneity	
CJ 201	Introduction to Criminal Justice	
EMGT 261	Disaster Preparedness	
EMGT 263	Disaster Response	
EMGT 414	Spatial Analysis in Emergency Management	
EMGT 461	Business Continuity and Crisis Management	
EMGT 481	Disaster Analysis	
GEOG 262	Geography of North America	
NRM 401	Urban-Ecosystem Management	
NRM 421	Environmental Outreach Methods	
POLS 225	Comparative Politics	

POLS 422	State and Local Politics	
SOC 403	Sociology of The Great Plains	
SOC 418	Social Psychology	
SOC 431	Environmental Sociology	
SOC 443	International Disasters	
ANTH 205	Human Origins	
ANTH 433	Apes and Human Evolution	
ANTH 462	Anthropology and the Environment	
ANTH 481	Qualitative Methods in Cultural Anthropology	
EMGT 101	Emergencies, Disasters, and Catastrophes	
EMGT 262	Disaster Mitigation	
EMGT 264	Disaster Recovery	
EMGT 463	Voluntary Agency Disaster Services	
ENGL 474	Native American Literature	
NRM 420	Scenarios in Natural Resources Management	
POLS 215	Problems and Policies In American Government	
POLS 360	Principles of Public Administration	
POLS 453	Environmental Policy and Politics	
SOC 405	Community Development	
SOC 439	Social Change	
SOC 465	Applied Demographics	
Total Credits		38

Degree Notes:

- **Acceptable Substitutions:** The following courses are accepted as electives in all emphasis areas: NRM courses (may not be double-counted with the NRM Core); a maximum of 3 credits of Field Experience (396/496); a maximum of 3 credits of Co-op Ed (397/497). **All other substitutions require NRM advisor approval and a substiution form to be completd and submitted to the Office of Registration and Records.**

Minor Requirements

Natural Resources Management Minor

Minor Requirements

Required Credits: 19

Core Courses

NRM 150	Natural Resource Management Orientation	1
NRM 225	Natural Resources & Agrosystems	3
NRM 431	National Environmental Policy Act & Environmental Impact Assessment	3

Interdisciplinary Courses

I. Biotic Resources Science: Select one of the following:		3
BIOL/ZOO 364	General Ecology	
BOT/RNG 460	Plant Ecology	
NRM/RNG 453	Rangeland Resource/Watershed Management	
RNG 336	Introduction to Range Management	
II. Physical/Earth Resources Science: Select one of the following:		3
ASM/NRM/SOIL 264	Natural Resource Management Systems	
GEOL 105	Physical Geology	

SOIL 210	Introduction to Soil Science	
SOIL 217	Introduction to Meteorology & Climatology	
III. Social Sciences: Select two of the following:		6
HIST 434	Environmental History	
SOC 431	Environmental Sociology	
NRM 421	Environmental Outreach Methods	
POLS 442	Global Policy Issues	
POLS 453	Environmental Policy and Politics	
ECON 481	Natural Resource Economics	
Total Credits		19

Minor Requirements and Notes:

- Students must earn a 2.00 minimum GPA in the courses used to satisfy the minor requirements.
- A minimum of 8 credits must be taken at NDSU.