Learn how to plan and manage parks, wilderness, forests, lakes, rivers, and other natural resources for the visitors who enjoy them, for the communities who depend on them, and for society as a whole. The curriculum emphasizes natural and managed protected areas; natural resources-oriented recreation programs in public and private sectors; social science aspects of natural resource use; and skills in communication, planning, and management. Graduates are involved in land management, park management, visitor education, tourism, and more.

**Communication Skills**
- Freshman Composition
- COMM 1101 Introduction to Public Speaking [CIV] (3 cr, F/S/Sm)
  - or AECM 2421W Professional and Oral Communication for Agriculture, Food, and the Environment (3 cr, F/S)

**Physical and Biological Sciences**
- BIOL 1001 Introductory Biology: Evolutionary and Ecological Perspectives [BIOL] (4 cr, F/S)
  - or BIOL 1009 General Biology [BIOL] (4 cr, F/S/Sm, prereq high school chemistry)
- PMB 2022 General Botany (3 cr, F/S, prereq one semester of college biology)
- SOIL 2125 Basic Soil Science [PHYS, ENV] (4 cr, F/S, prereq CHEM 1015/1017 or CHEM 1061)

**Mathematical Thinking**
- MATH 1031 College Algebra and Probability [MATH] (3 cr, F/S/Sm, prereq 3 yrs. high school math or placement exam or at least C- in PSTL 731 or PSTL 732)
  - or MATH 1051 Precalculus I [MATH] (3 cr, F/S/Sm, prereq 3 yrs high school math or placement test or at least C- in PSTL 731 or PSTL 732)
- ESPM 3012 Statistical Methods for Environmental Scientists and Managers [MATH] (4 cr, S, prereq 2 years high school math)
  - or STAT 3011 Introduction to Statistical Analysis [MATH] (4 cr, F/S/Sm)

**Chemistry**
- CHEM 1015 Introductory Chemistry: Lecture (3 cr, F/S/Sm, prereq high school chemistry)
  - and CHEM 1017 Introductory Chemistry: Lab (1 cr, F/S/Sm)
  - or CHEM 1061 Chemical Principles I [PHYS] (3 cr, F/S/Sm, prereq passing grade in CHEM 1101 or 1015 or placement) and CHEM 1065 Chemical Principles I Lab [PHYS] (1 cr, F/S/Sm)
  - or CHEM 1071H Honors Chemistry I [PHYS] (1 cr, F) and CHEM 1075H Honors Chemistry I Lab [PHYS] (1 cr, F)

**Economics and Policy**
- ESPM 3261 Economics and Natural Resources Management [SOCS, ENV] (4 cr, S, prereq MATH 1031, 1051, 1142, 1155, or 1271 or ESPM 3012 or STAT 3011 or SOC 3811)
- ESPM 3241W Natural Resource and Environmental Policy [SOCS, CIV, WI] (3 cr, S)
- PSY 1001 Introduction to Psychology [SOCS] (4 cr, F/S/Sm)
  - or SOC 1001 Introduction to Sociology [SOCS, DSJ] (4 cr, F/S/Sm)
- PSY 3201 Introduction to Social Psychology (3 cr, F/S/Sm, prereq PSY 1001)
  - or SOC 3721 Principles of Social Psychology (3 cr, F, prereq SOC 1001 recommended)

**Major Professional Courses**
- FNRM 1001 Orientation and Information Systems (1 cr, F)
- FNRM 1101 Dendrology: Identifying Forest Trees and Shrubs (3 cr, F)
Liberal Education Requirements and Writing Intensive

<table>
<thead>
<tr>
<th>Diversified Core</th>
<th>Required Credits</th>
<th>PPAM courses that fulfill requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts/Humanities [AH]</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Biological Science [BIOL]</td>
<td>4, must include lab or field experience</td>
<td>BIOL 1001 or 1009</td>
</tr>
<tr>
<td>Historical Perspective [HIS]</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Literature [LIT]</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Mathematical Thinking [MATH]</td>
<td>3</td>
<td>MATH 1031 or 1051</td>
</tr>
<tr>
<td>Physical Science [PHYS]</td>
<td>4, must include lab or field experience</td>
<td>SOIL 2125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CHEM 1015/1017 or CHEM 1061/1065</td>
</tr>
<tr>
<td>Social Sciences [SOCS]</td>
<td>3</td>
<td>ESPM 3261, SOC 1001 or PSY 1001</td>
</tr>
</tbody>
</table>

Designated Themes

<table>
<thead>
<tr>
<th>Designated Themes</th>
<th>Four of the following five themes must be satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civic Life and Ethics [CIV]</td>
<td>3</td>
</tr>
<tr>
<td>Diversity and Social Justice in the US [DSJ]</td>
<td>3</td>
</tr>
<tr>
<td>The Environment [ENV]</td>
<td>3</td>
</tr>
<tr>
<td>Global Perspectives [GP]</td>
<td>3</td>
</tr>
<tr>
<td>Technology and Society [TS]</td>
<td>3</td>
</tr>
</tbody>
</table>

Writing Intensive [WI]: first year writing requirement and four writing intensive courses (two of which must be taken at the upper division level, one of which must be in your major)

Park and Protected Area Management (PPAM) Core

<table>
<thead>
<tr>
<th>FNRM 3101 Park and Protected Area Tourism (3 cr, F odd years)</th>
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</thead>
<tbody>
<tr>
<td>FNRM 5259 Visitor Behavior Analysis (3 cr, F, jr, sr, or grad status)</td>
</tr>
<tr>
<td>ESPM 3202W Environmental Conflict Management, Leadership and Planning (3 cr, S)</td>
</tr>
<tr>
<td>ESPM 3245 Sustainable Land Use Planning and Policy [ENV] (3 cr, F, prereq jr or sr)</td>
</tr>
<tr>
<td>ESPM 4811 Environmental Interpretation (3 cr, S, prereq jr or sr)</td>
</tr>
</tbody>
</table>

Management of Biophysical Resources

<table>
<thead>
<tr>
<th>FNRM 3104 Forest Ecology (4 cr, F, prereq BIOL 1001 or 1009, college chemistry recommended)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESPM 3108 Ecology of Managed Systems [ENV] (3cr, F, prereq BIOL1001, 1009 or HORT 1001)</td>
</tr>
<tr>
<td>FNRM 3114 Hydrology and Watershed Management (3 cr, F, prereq MATH 1151, BIOL 1001 or 1009, and CHEM 1015/1017 or CHEM 1061/1065)</td>
</tr>
<tr>
<td>ESPM 4061W Water Quality and Natural Resources (3 cr, F)</td>
</tr>
<tr>
<td>FW 2001W Intro to Fisheries, Wildlife, and Conservation Biology [ENV] [WI] (3 cr, F/S, prereq BIOL 1001 or 1009)</td>
</tr>
<tr>
<td>FW 4102 Principles of Conservation Biology [ENV] (3 cr, S, prereq BIOL 1009)</td>
</tr>
<tr>
<td>FW 4103 Principles of Wildlife Management (3 cr, S, prereq intro biology, jr or sr)</td>
</tr>
</tbody>
</table>

Field Course(s) or Internship

Requirement ranging from 1-4 credits.

<table>
<thead>
<tr>
<th>CFAN 3096 Making the Most of Your Professional Experience (1 cr, S, prereq secured internship or instructor consent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNRM 3206 Park and Protected Area Management Field Studies (2 cr, Fall registration with August dates, prereq soph, jr, sr)</td>
</tr>
</tbody>
</table>
or Introductory Cloquet Field Session at the Cloquet Forestry Center, Cloquet, MN

- FNRM 2101 Identifying Forest Plants (1 cr)
- FNRM 2102 Northern Forests Field Ecology (2 cr)
- FNRM 2104 Measuring Forest Resources (1 cr)

**Experiential Learning**

- FNRM 4232W Managing Recreational Lands fulfills this requirement.

**Interdisciplinary Learning**

- One of the following courses fulfills this requirement:
  - FW 2001W Introduction to Fisheries, Wildlife, and Conservation Biology [ENV] [WI] (3 cr)
  - AGRO 3203W Environment, Global Food Production, and the Citizen [GP, WI] (3 cr)
  - AGRO 3305 Agroecosystems of the World [GP] (3 cr)
  - ANSC 3203W Environment, Global Food Production, and the Citizen [GP, WI] (3 cr)
  - APEC 3202 An Introduction to the Food System: Analysis, Management, and Design (3 cr)
  - CFAN 2333 Insects, Microbes, and Plants [TS] (3 cr)
  - ESPM 1011 Issues in the Environment [ENV] (3 cr)
  - ESPM 2021 Environmental Sciences: Integrated Problem Solving (3 cr)
  - ESPM 3575 Wetlands (3 cr)
  - ESPM 4021W Problem Solving: Environmental Review [WI] (4 cr)
  - ESPM 4041W Problem Solving for Environmental Change [WI] (4 cr)
  - FNRM 4501 Urban Forest Management: Managing Greenspaces for People (3 cr)
  - FSCN 1102 Food: Safety, Risks, and Technology [CIV] (3 cr)
  - GCC 3001/5001 Can We Feed the World Without Destroying It? [ENV] (3 cr)
  - GCC 3007/5007 Toward Conquest of Disease [ENV] (3 cr)
  - GCC 5008 Policy and Science of Global Environmental Change [ENV] (3 cr)
  - GCC 3010/5010 Grand Challenge, The Global Climate Challenge: Creating an Empowered Movement for Change [CIV] (3 cr)
  - GCC 3013/5013 Making Sense of Climate Change: Science, Art and Agency [CIV] (3 cr)
  - GCC 3017/5017 World Food Problems: Agronomics, Economics and Hunger [GP] (3 cr)
  - GCC 3031/5031 The Global Climate Challenge: Creating an Empowered Movement for Change [CIV] (3 cr)
  - PLPA 2003 Plague, Famine, and Beer: The Impact of Microscopic Organisms on Human Civilization [HIS] (3 cr)
  - SSM 4407W Sustainable Manufacturing Principles and Practices [WI] (3 cr)

**Electives**

At the University, 120 credits are required for graduation. After completing the major requirements, credits from any discipline may be used to reach 120 credits.

**Minors and Certificates**

Minors and certificates are an excellent way to further focus your studies in a related area of interest. The following are minors and certificates typically of interest to students in natural resources.

- Environmental Sciences, Policy and Management (16 cr)
- Fisheries and Wildlife (16-18 cr)
- Forest Ecosystem Management and Conservation (18-19 cr)
- Geographic Information Science (16 cr)
- Mass Communications-Emphasis in Public Relations (18 cr)
- Sustainable Tourism Certificate (12 cr in addition to FNRM 3101)
- Sustainability Studies (15-18 cr)
- Urban and Community Forestry (19-21 cr)
Study Abroad
The University encourages students to incorporate international study into their academic programs. In addition to those programs offered at the University level, the College of Food, Agricultural and Natural Resource Sciences also offers international programs specific to many of the majors housed within the college. Visit the Learning Abroad Center or CFANS International Programs Office to learn more about the many study abroad experiences available.

Subject/ Career Options
Students may also use their elective credits to develop additional coursework to further build knowledge and skill for employment. These are not required or equivalent to minors. See your advisor or faculty leader(s) noted for more information and assistance selecting courses. Subject and/or career option areas to consider include:

- Heritage Preservation Management
- International Protected Area Management
- Outdoor Recreation Planning
- Protected Area Law and Policy
- Tourism
- Graduate Study Preparation

The Heritage Preservation Management Option (Faculty: M. Davenport, M. Dockry, I. Schneider) is for students with a particular interest in cultural and heritage preservation within public agencies. Students focusing in this area could work with a variety of state, federal or international organizations to manage and plan for heritage preservation. Coursework could include ANTH 3028 Intro to Historical Archeaology, ANTH 3980 Topics in Anthropology, ANTH 5990 Topics in Archaeology International Heritage Management, FNRM 3206 Park and Protected Area Management Field Studies (prereq soph or higher, 10-day session in Ely, MN) or study abroad coursework.

The International Protected Area Management Option (Faculty: M. Davenport, F. Fleischman, I. Schneider, D. Current, K. Nelson) is for students interested in international protected area management. Career opportunities include management, administration and development positions for protected areas across the globe. Coursework could include ANTH 3980 Topics in Anthropology, ANTH 5990 Topics in Archaeology International Heritage Management, ESPM 3251 Natural Resources in Sustainable International Development, GEOG 3379 Environment and Development in the Third World, Introductory Cloquet Field Training in Assessment and Biology of Forests (taught at Cloquet Forestry Station, Cloquet, MN in August and includes FNRM 2101 Identifying Forest Plants, FNRM 2102 Northern Forests Field Ecology, and FNRM 2104 Measuring Forest Resources), or language or study abroad courses.

The Outdoor Recreation Planning Option (Faculty: M. Davenport, I. Schneider) is for students interested in planning for outdoor recreation areas across landscape levels: county, state and federal. Career opportunities include positions as an outdoor recreation planner, regional planner, or county recreation planner. Coursework could include ESPM 3271 Environmental Policy, Law and Human Behavior, GEOG 3361W Geography and Public Policy, GEOG 3605 Geographic Perspectives on Planning, LA 3002 Informants of Creating Landscape Space, LA 3501 Environmental Design and Its Biological and Physical Context, FNRM 3206 Park and Protected Area Management Field Studies (prereq soph or higher, 10-day session in Ely, MN), Introductory Field Training in Assessment and Biology of Forests (taught at Cloquet Forestry Station, Cloquet, MN in August and includes FNRM 2101 Identifying Forest Plants, FNRM 2102 Northern Forests Field Ecology, and FNRM 2104 Measuring Forest Resources), or study abroad courses.

The Protected Area Law and Policy Option (Faculty: F. Fleischman, M. Kilgore, K. Nelson, M. Dockry, M. Davenport, I. Schneider) is for students interested in understanding how, where and why policy evolves and influences protected area management. Career opportunities include policy development and analysis and protected area administration. Coursework could include ESPM 3271 Environmental Policy, Law and Human Behavior, GEOG 3361W Geography and Public Policy, ESPM 4242 Methods for Environmental and Natural Resource Policy Analysis, ESPM 4256 Natural Resource Law and the Management of Public Lands and Waters, FNRM 3206 Park
and Protected Area Management Field Studies (prereq soph or higher, 10-day session in Ely, MN), and management of public lands and waters, or study abroad courses.

The **Resource-Based Tourism Option** *(Faculty: I. Schneider)* is for students interested in tourism. Career opportunities include managing, administration, promotion, and development of tourism attractions and destinations. Coursework could include ESPM 3271 Environmental Policy, Law and Human Behavior, MKTG 3001 Principles of Marketing, MGMT 3001 Fundamentals of Management, MKTG 3040 Buyer Behavior, MKTG 4050 Advertising and Promotion, MKTG 4060 Marketing Channels, GEOG 3388 Going Places: Geographies of Travel and Tourism, or study abroad courses.

**Graduate Study Option** *(Faculty: All)* Students interested in graduate school should strengthen their undergraduate core and take prerequisites for classes likely to be needed in graduate school. Students should meet with faculty in their area of interest to develop their coursework. Math, science and basic courses also help students prepare for the Graduate Record Exam (GRE).