### Geospatial Science Concentration (39 units)

**Lower Division**
- GEOG 106 (3) Physical Geography
- GSP 270 (3) Geographic Information Science (GIS)

**Upper Division**
- GSP 316 (4) Cartography
- GSP 318 (3) Geospatial Programming I
- GSP 326 (3) Intermediate Remote Sensing
- GSP 330 (3) Mobile Mapping
- GSP 370 (3) Intermediate GIS
- GSP 418 (3) Geospatial Programming II, or
- GSP 436 (3) Advanced Remote Sensing, or
- GSP 470 (3) Advanced Geospatial Analysis & Modeling

Complete one ecology & management course:
- ESM 355 (3) Principles of Ecological Restoration
- ESM 370 (3) Energy Technology & Society
- ESM 420 (3) Ecosystem Analysis
- ESM 430 (3) Natural Resource Management in Protected Areas

**FOR 321 (3) Fire Ecology**

**FOR 374 (3) Wilderness Area Management**

**FISH 476‡ (3) Ecology of Running Waters**

**WLD 460‡ (3) Conservation Biology**

Complete one natural resource science fundamentals course:
- FOR 130 (3) Dendrology
- GEOL 109 (3) General Geology
- SOIL 260 (3) Intro to Soil Science
- BOT 350† (4) Plant Taxonomy
- WSHD 310 (4) Hydrology & Watershed Management

Complete two upper division policy and management courses, chosen from a list of approved courses provided by your advisor, from ENGR, FISH, FOR, GEOG, NAS, PHIL, PSCI, RRS, SOIL, WSHD, WLDF. (Prerequisites may be required for some courses, depending on choice.)

**NOTE:** 24 units may double-count toward GE requirements.

### Ecological Restoration Minor

**Total units required for the minor:** 16

**BOT 105 (4) General Botany**

**SDIL 260 (3) Intro to Soil Science**

**ESM 355 (3) Principles of Ecological Restoration**

Complete either:
- FOR 315 (3) Forest Management and Rangeland Resource Principles and
- FOR 431 (3) Forest Restoration
- RRS 306 (3) Rangeland Resource Principles and

**FOR 321 (3) Fire Ecology**

**FOR 374 (3) Wilderness Area Management**

**FISH 476‡ (3) Ecology of Running Waters**

**WLD 460‡ (3) Conservation Biology**

**WLD 468 (3) Spatial Wildlife Ecology**

**NOTE:** 27 units may double-count toward GE requirements.

### Environmental Education & Interpretation Minor

**Total units required for the minor:** 19

**ESM 215 (3) Natural Resources & Recreation**

**ESM 253 (3) Interpretive Computer Graphics [or equivalent]**

**ESM 350/351 (3/1) Fundamentals of Environmental Education & Interpretation, and Field Trip**

**ESM 353 (3) Environmental Education & Interpretation Graphics**

**ESM 430 (3) Natural Resource Management in Protected Areas**

**ESM 450 (3) Applied Environmental Education & Interpretation**

### Environmental & Natural Resources Planning Minor

**Total units required for the minor:** 18-19

**GEOG 106 (3) Physical Geography**

**ESM 105 (3) Natural Resource Conservation**

**ESM 210 (3) Public Land Use Policies & Management**

**ESM 360 (3) Intro to Environmental Planning Methods**

Plus two courses from the following:
- ESM 325 (3) Environmental Law & Regulation
- ESM 365 (3) Local Government Planning
- ESM 425 (3) Environmental Impact Assessment

### Environmental Policy Minor

**Total units required for the minor:** 18-19

**ESM 105 (3) Natural Resources Conservation**

**ESM 210 (3) Public Land Use Policies & Management**

**ESM 325 (3) Environmental Law & Regulation**

**ESM 425 (3) Environmental Impact Assessment**

**PSCI 306 (3) Environmental Politics**

Complete one course from the following:
- ECON 423 (3) Environmental & Natural Resource Economics
- NAS 332 (3) Environmental Justice
- PSCI 317 (4) Public Policy Process
- PSCI 352 (3) Water Politics
- PSCI 364 (3) Technology & Development
- PSCI 373 (3) Politics of Sustainability
- PSCI 412 (3) Legal Research
- WSHD 430 (3) Water Rights/Water Law

‡ Course requires one or more prerequisites that are not required in the major.
## Natural Resources Minor

Total units required for the minor: 19

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 105</td>
<td>4</td>
<td>Principles of Biology</td>
</tr>
<tr>
<td>ESM 105</td>
<td>3</td>
<td>Natural Resource Conservation</td>
</tr>
<tr>
<td>SOIL 260</td>
<td>3</td>
<td>Introduction to Soil Science</td>
</tr>
</tbody>
</table>

At least three courses from the following (at least 6 units must be 300 or above):

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESM 210</td>
<td>3</td>
<td>Public Land Use Policies &amp; Management</td>
</tr>
<tr>
<td>ESM 215</td>
<td>3</td>
<td>Natural Resources &amp; Recreation</td>
</tr>
<tr>
<td>ESM 365</td>
<td>3</td>
<td>Local Government Planning</td>
</tr>
<tr>
<td>FISH 300</td>
<td>3</td>
<td>Introduction to Fishery Biology</td>
</tr>
<tr>
<td>FOR 315</td>
<td>3</td>
<td>Forest Management</td>
</tr>
<tr>
<td>FOR 374</td>
<td>3</td>
<td>Wilderness Area Mgmt.</td>
</tr>
<tr>
<td>OCN 301</td>
<td>3</td>
<td>Marine Ecosystems — Human Impact</td>
</tr>
<tr>
<td>OCN 304</td>
<td>3</td>
<td>Resources of the Sea</td>
</tr>
<tr>
<td>RRS 306</td>
<td>3</td>
<td>Wildland Resource Principles</td>
</tr>
<tr>
<td>WLDF 301</td>
<td>3</td>
<td>Principles of Wildlife Management</td>
</tr>
</tbody>
</table>

## Natural Resources Recreation Minor

Total units required for the minor: 17-18

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESM 210</td>
<td>3</td>
<td>Public Land Use Policies &amp; Management</td>
</tr>
<tr>
<td>ESM 215</td>
<td>3</td>
<td>Natural Resources &amp; Recreation</td>
</tr>
<tr>
<td>ESM 305</td>
<td>3</td>
<td>Environmental Conflict Resolution, or</td>
</tr>
<tr>
<td>ESM 309B</td>
<td>3</td>
<td>Environmental Communication</td>
</tr>
<tr>
<td>FOR 374</td>
<td>3</td>
<td>Wilderness Area Mgmt.</td>
</tr>
<tr>
<td>ESM 415</td>
<td>3</td>
<td>Recreation &amp; Park Planning, or</td>
</tr>
<tr>
<td>ESM 440</td>
<td>2</td>
<td>Managing Recreation Visitors</td>
</tr>
<tr>
<td>ESM 430</td>
<td>3</td>
<td>NR Management in Protected Areas</td>
</tr>
</tbody>
</table>