# Geographic Information Science (M.S.)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Core Curriculum: 18 cr. (non-thesis-16 cr. plus 2 cr. 599) - 22 cr. (thesis) (16 cr. plus 6 cr. 500)</strong></td>
<td></td>
</tr>
<tr>
<td>GEOG 475</td>
<td>Intermediate GIS</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 583</td>
<td>Remote Sensing/GIS Image Analysis</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 507</td>
<td>Spatial Analysis and Modeling</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 525</td>
<td>Graduate GIS Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 593</td>
<td>Geovisualization</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 596</td>
<td>Geography Department Seminar</td>
<td>1</td>
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<td></td>
<td><strong>Thesis or Non-Thesis Track:</strong></td>
<td>2-6</td>
</tr>
<tr>
<td>GEOG 500</td>
<td>Master's Research and Thesis (Thesis students will take 6 thesis credits)</td>
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</tr>
<tr>
<td>or GEOL 500</td>
<td>Master's Research and Thesis</td>
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</tr>
<tr>
<td>Non-Thesis Track (2 credits):</td>
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<tr>
<td>GEOG 599</td>
<td>Research (Research students will take 2 research credits)</td>
<td></td>
</tr>
<tr>
<td>or GEOL 599</td>
<td>Research</td>
<td></td>
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<tr>
<td></td>
<td><strong>Application Areas</strong></td>
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<tr>
<td></td>
<td>Select one of the Following Application Areas:</td>
<td>8-12</td>
</tr>
<tr>
<td></td>
<td>Remote Sensing (p. 1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GIS Programming (p. 1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Natural Hazards and Emergency Planning (p. 1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Geospatial Aspects of Sustainable Planning (p. 1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Geotechnician (p. 1)</td>
<td></td>
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<tr>
<td></td>
<td>Geospatial Habitat Assessment (p. 2)</td>
<td></td>
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<tr>
<td></td>
<td>Geospatial Intelligence (p. 2)</td>
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<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td>26-34</td>
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<tr>
<td></td>
<td><strong>Courses to total 30 credits for this degree</strong></td>
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## A. Remote Sensing

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 524</td>
<td>Hydrologic Applications of GIS and Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>NRS 578</td>
<td>LIDAR and Optical Remote Sensing Analysis</td>
<td>3</td>
</tr>
<tr>
<td>FOR/NRS 472</td>
<td>Remote Sensing of the Environment</td>
<td>4</td>
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<tr>
<td>FOR 535</td>
<td>Remote Sensing of Fire</td>
<td>3</td>
</tr>
<tr>
<td>REM 476</td>
<td>Unmanned Aerial Systems (UAS) Operations</td>
<td>1</td>
</tr>
<tr>
<td>REM 475</td>
<td>Remote Sensing Application with Unmanned Aerial Systems (UAS)</td>
<td>3</td>
</tr>
<tr>
<td>ECE 516</td>
<td>Image Sensors and Systems</td>
<td>3</td>
</tr>
<tr>
<td>NRS 552</td>
<td>Current Lit in Remote Sensing</td>
<td>1</td>
</tr>
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</table>

## B. GIS Programming

Select 8 credits for thesis, 12 credits for non-thesis from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 479</td>
<td>GIS Programming</td>
<td>3</td>
</tr>
<tr>
<td>STAT 419</td>
<td>Introduction to SAS/R Programming</td>
<td>3</td>
</tr>
<tr>
<td>STAT 426</td>
<td>SAS Programming</td>
<td>3</td>
</tr>
<tr>
<td>STAT 427</td>
<td>R Programming</td>
<td>3</td>
</tr>
<tr>
<td>ENVS 511</td>
<td>Data Wizardry in Environmental Sciences</td>
<td>3</td>
</tr>
<tr>
<td>CS 479</td>
<td>Data Science</td>
<td>3</td>
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## C. Natural Hazards and Emergency Planning

Select 8 credits for thesis, 12 credits for non-thesis from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 411</td>
<td>Natural Hazards and Society</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 414</td>
<td>Socioeconomic Applications of GIS</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 567</td>
<td>Volcanology</td>
<td>3</td>
</tr>
<tr>
<td>FIRE 554</td>
<td>Air Quality, Pollution, and Smoke</td>
<td>3</td>
</tr>
<tr>
<td>NRS 576</td>
<td>Environmental Project Management and Decision Making</td>
<td>2</td>
</tr>
<tr>
<td>NRS 588</td>
<td>NEPA in Policy and Practice</td>
<td>3</td>
</tr>
<tr>
<td>CE 535</td>
<td>Fluvial Geomorphology and River Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>GEOE 535</td>
<td>Seepage and Slope Stability</td>
<td>3</td>
</tr>
<tr>
<td>TM 517</td>
<td>Critical Infrastructure Security and Resilience Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>TM 525</td>
<td>Emergency Management and Planning</td>
<td>3</td>
</tr>
<tr>
<td>INDT 470</td>
<td>Homeland Security</td>
<td>3</td>
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## D. Geospatial Aspects of Sustainable Planning

Select 8 credits for thesis, 12 credits for non-thesis from the following:

<table>
<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>GEOG 535</td>
<td>Climate Change Mitigation</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 414</td>
<td>Socioeconomic Applications of GIS</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 536</td>
<td>Principles of Sustainability</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 544</td>
<td>Water Quality in the Pacific Northwest</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 548</td>
<td>Drinking Water and Human Health</td>
<td>3</td>
</tr>
<tr>
<td>ENVS 520</td>
<td>Introduction to Bioregional Planning</td>
<td>3</td>
</tr>
<tr>
<td>ENVS 523</td>
<td>Planning Sustainable Places</td>
<td>3</td>
</tr>
<tr>
<td>ENVS 530</td>
<td>Planning Theory and Process</td>
<td>3</td>
</tr>
<tr>
<td>ENVS 511</td>
<td>Data Wizardry in Environmental Sciences</td>
<td>3</td>
</tr>
<tr>
<td>TM 517</td>
<td>Critical Infrastructure Security and Resilience Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>TM 525</td>
<td>Emergency Management and Planning</td>
<td>3</td>
</tr>
</tbody>
</table>

## E. Geotechnician

Select 8 credits for thesis, 12 credits for non-thesis from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>
1. Demonstrate a depth of knowledge of spatial analysis and mapping techniques.
2. Demonstrate the ability to gather and analyze appropriate data and write results in context of existing literature and significance of the analysis.
3. Demonstrate advanced skills to conduct either disciplinary or interdisciplinary analyses using geographical information systems methods and datasets for Earth system science problems.
4. Apply mastery of key principals and core concepts in geographical information systems with a depth of knowledge in one of seven application areas cover critical land resource management and industrial workforce needs.
5. Demonstrate the ability to synthesize ideas and information to identify, analyze and problem-solve Earth system science and land resource management issues; demonstrate an application of this synthesis.
6. Collaborate with a faculty advisor and graduate committee to conduct independent research.
7. Communicate effectively, professionally, and within group settings.