EARTH SYSTEMS SCIENCE, MS (GGS)

Banner Code: SC-MS-ESSC

Academic Advising

4400 University Drive, MSN 6C3
Fairfax, VA 22030
Phone: 703-993-1210
Email: ggs@gmu.edu
Website: cos.gmu.edu/ggs/academic-programs/ms-in-earth-systems-science/

This is a shared program between the Department of Atmospheric, Oceanic, and Earth Sciences and the Department of Geography and Geoinformation Science.

The program addresses the growing demand for trained professionals in the Earth sciences. The degree emphasizes a research-oriented, global systems approach to studying the Earth and its systems: the atmosphere, the hydrosphere, and the lithosphere, including their interrelationships and interactions with the biosphere. Emphasis is on the observation, measurement, and analysis of Earth's systems.

Most student research projects and theses will relate to geologic and geographic topics, however studies of related topics in Earth science are welcome. Students completing the program are qualified to pursue careers that require knowledge of the basics of Earth systems science and the requisite tools, specifically pertaining to the area of Earth science that they choose to investigate. Students are encouraged to undertake a master's thesis but may choose a research project. In the latter case, students must pass a comprehensive exam.

Admissions & Policies

Admissions

University-wide admissions policies can be found in Graduate Admissions Policies.

To apply for this program, please complete the George Mason University Admissions Application (https://www2.gmu.edu/admissions-aid/apply-now).

Eligibility

Applicants should have earned a BS degree in atmospheric, Earth, environmental, geological, geographical, ocean, or physical science. Previous coursework should include two semesters each of calculus, chemistry, and physics, and one semester of statistics. Applicants should have a minimum GPA of 3.00 in their undergraduate degree.

Application Requirements

Official transcripts from each college and graduate institution attended, a current résumé, and a goals statement are required. Applicants also need three letters of recommendation and an official report of scores obtained on the GRE-GEN. The GRE requirement for admission may be waived if the student holds a master's degree from a regionally accredited U.S. institution. TOEFL scores are required of all international applicants.

Policies

For policies governing all graduate programs, see AP.6 Graduate Policies.

Requirements

Total credits: 30

Students should refer to the Admissions & Policies tab for specific policies related to this program.

Candidates must complete 10 credits of GGS courses and 10 credits of GEOL/CLIM courses toward their requirements. ("Culminating Experience" credits do not count towards this requirement).

Earth Science Core

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLIM</td>
<td>Introduction to Physical Climate System</td>
<td>3</td>
</tr>
<tr>
<td>CLIM</td>
<td>Land-Climate Interactions</td>
<td>3</td>
</tr>
<tr>
<td>GEOL</td>
<td>Paleoclimatology</td>
<td>3</td>
</tr>
<tr>
<td>GGS</td>
<td>Introduction to Atmosphere and Weather</td>
<td>3</td>
</tr>
<tr>
<td>PHYS</td>
<td>Atmospheric Physics I</td>
<td>3</td>
</tr>
<tr>
<td>CLIM</td>
<td>Physical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>CLIM</td>
<td>Physical and Dynamical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>GEOL</td>
<td>Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>GGS</td>
<td>The Hydrosphere</td>
<td>3</td>
</tr>
<tr>
<td>GEOL</td>
<td>Soil Science</td>
<td>3</td>
</tr>
<tr>
<td>GGS</td>
<td>The Lithosphere</td>
<td>3</td>
</tr>
<tr>
<td>or GEOL</td>
<td>The Lithosphere</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td>9</td>
</tr>
</tbody>
</table>

Techniques

Select two courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GGS</td>
<td>Geographic Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>GGS</td>
<td>Quantitative Methods</td>
<td>3</td>
</tr>
<tr>
<td>GGS</td>
<td>Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>GGS</td>
<td>Earth Image Processing</td>
<td>3</td>
</tr>
<tr>
<td>GGS</td>
<td>Earth Science Data and Advanced Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td>6</td>
</tr>
</tbody>
</table>

1 Other courses can be substituted with advisor approval.

Colloquium

Select one from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GGS</td>
<td>Geography and Geoinformation Science</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Colloquium</td>
<td>1</td>
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<tr>
<td></td>
<td>Total Credits</td>
<td>1</td>
</tr>
<tr>
<td>Code</td>
<td>Title</td>
<td>Credits</td>
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<tr>
<td>------</td>
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</tr>
<tr>
<td>GEOL 536</td>
<td>Paleontology Seminar</td>
<td></td>
</tr>
<tr>
<td>GEOL 792</td>
<td>Seminar in Earth Systems Science, Geology, Earth Science</td>
<td></td>
</tr>
<tr>
<td>CLIM 991</td>
<td>Climate Dynamics Seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>2</strong></td>
</tr>
</tbody>
</table>

### Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select 10 credits from courses at the 500 to 900-level (excluding 700, 798, and 799 courses)</td>
<td><strong>10</strong></td>
</tr>
<tr>
<td>CLIM Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOL Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GGS Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EVPP Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

### Culminating Experience

Choose the culminating experience of either a thesis or a project (either must total 3 credits):

#### Thesis

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select 3 credits from the following:</td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>GGS 799</td>
<td>Thesis</td>
<td></td>
</tr>
<tr>
<td>GEOL 799</td>
<td>Master’s Thesis in Earth Systems Science</td>
<td></td>
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<tr>
<td>CLIM 799</td>
<td>Master’s Thesis in Climate</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>

#### Project

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select one from the following:</td>
<td><strong>1</strong></td>
</tr>
<tr>
<td>GGS 700</td>
<td>Comprehensive Exam</td>
<td></td>
</tr>
<tr>
<td>GEOL 700</td>
<td>Comprehensive Exam</td>
<td></td>
</tr>
<tr>
<td>CLIM 700</td>
<td>Climate Comprehensive Exam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select one from the following:</td>
<td><strong>2</strong></td>
</tr>
<tr>
<td>GGS 798</td>
<td>Research Project in Earth Systems Science</td>
<td></td>
</tr>
<tr>
<td>GEOL 798</td>
<td>Master’s Research Project in Earth Systems Science</td>
<td></td>
</tr>
<tr>
<td>CLIM 798</td>
<td>Master’s Climate Research Project</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>