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

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>
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</thead>
<tbody>
<tr>
<td></td>
<td>Select one course from each of the following:</td>
<td>9</td>
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<tr>
<td><strong>Atmosphere:</strong></td>
<td></td>
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<tr>
<td>CLIM 710</td>
<td>Introduction to Physical Climate System</td>
<td></td>
</tr>
<tr>
<td>CLIM 714</td>
<td>Land-Climate Interactions</td>
<td></td>
</tr>
<tr>
<td>GEOL 532</td>
<td>Paleoclimatology</td>
<td></td>
</tr>
<tr>
<td>GGS 670</td>
<td>Introduction to Atmosphere and Weather</td>
<td></td>
</tr>
<tr>
<td>PHYS 575</td>
<td>Atmospheric Physics I</td>
<td></td>
</tr>
<tr>
<td><strong>Hydrosphere:</strong></td>
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<td></td>
</tr>
<tr>
<td>CLIM 512</td>
<td>Physical Oceanography</td>
<td></td>
</tr>
<tr>
<td>CLIM 712</td>
<td>Physical and Dynamical Oceanography</td>
<td></td>
</tr>
<tr>
<td>GEOL 513</td>
<td>Hydrogeology</td>
<td></td>
</tr>
<tr>
<td>GGS 656</td>
<td>The Hydrosphere</td>
<td></td>
</tr>
<tr>
<td><strong>Lithosphere:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOL 506</td>
<td>Soil Science</td>
<td></td>
</tr>
<tr>
<td>GGS 657</td>
<td>The Lithosphere</td>
<td></td>
</tr>
<tr>
<td>or GEOL 601</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>or GEOL 601</td>
<td>The Lithosphere</td>
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<td>Total Credits</td>
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### Techniques

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<tr>
<td></td>
<td>Select two courses from the following:</td>
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<tr>
<td>GGS 553</td>
<td>Geographic Information Systems</td>
<td></td>
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<tr>
<td>GGS 560</td>
<td>Quantitative Methods</td>
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<tr>
<td>GGS 579</td>
<td>Remote Sensing</td>
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<tr>
<td>GGS 680</td>
<td>Earth Image Processing</td>
<td></td>
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<tr>
<td>GGS 754</td>
<td>Earth Science Data and Advanced Data</td>
<td></td>
</tr>
<tr>
<td>or GGS 754</td>
<td>Analysis</td>
<td></td>
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<td>Total Credits</td>
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</table>

1 Other courses can be substituted with advisor approval.

### Colloquium

<table>
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<tr>
<td></td>
<td>Select one from the following:</td>
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<tr>
<td>GGS 900</td>
<td>Geography and Geoinformation Science</td>
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<tr>
<td>or GGS 900</td>
<td>Colloquium</td>
<td></td>
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<tr>
<td></td>
<td>Total Credits</td>
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GEOL 536  Paleontology Seminar
GEOL 792  Seminar in Earth Systems Science, Geology, Earth Science
CLIM 991  Climate Dynamics Seminar

Total Credits 2

Electives

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

Culminating Experience

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

Thesis

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

Total Credits 3

Project

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
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<td></td>
<td>Select one from the following:</td>
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<tr>
<td></td>
<td>GGS 700  Comprehensive Exam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GEOL 700  Comprehensive Exam</td>
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<tr>
<td></td>
<td>CLIM 700  Climate Comprehensive Exam</td>
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</table>

Select one from the following: 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>GGS 798  Research Project in Earth Systems Science</td>
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<tr>
<td></td>
<td>GEOL 798  Master’s Research Project in Earth Systems Science</td>
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</tr>
<tr>
<td></td>
<td>CLIM 798  Master’s Climate Research Project</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits 3