

M.S. IN MARINE GEOSCIENCES

Overview

During their M.S. degree, MGS students use pioneering remote sensing and seismic techniques to assess the Earth's crustal movement and other physical processes in terrestrial, marine and coastal zones. They utilize a wide range of geophysical and geochemical toolboxes to improve their understanding of carbonate depositional systems, modern and ancient reefs, and terrestrial and oceanic sediment archives to learn more about past and present environmental changes.

Admission Requirements

The undergraduate student wishing to prepare for graduate work in the marine geosciences must be well trained in the basic sciences. The GRE score is not required for admission. You may optionally submit your GRE score, but not all faculty will consider this information. Individual faculty members may consider GRE scores as part of a holistic evaluation of the candidates. Applicants and whose first language is not English must pass the Test of English as a Foreign Language (TOEFL) with a score of at least 550. According to the special interests of the individual, the undergraduate major and minor should be in geology, physics, chemistry, and/or mathematics. All application requirements are available here (<https://graduate.earth.miami.edu/admissions/application-information/>).

Curriculum Requirements

| Code | Title | Credit Hours |
|--|-------------------------------|--------------|
| The MGS M.S. degree requires 30 total credits. ¹ | | |
| Course Requirements ² | | 6 |
| All MGS students must complete two of the following courses: | | |
| MGS 611 | Earth Surface Processes | |
| MGS 613 | Introductory Geochemistry | |
| MGS 614 | Geophysics | |
| Electives | | 18 |
| Thesis Research | | 6 |
| MGS 810 | Master's Thesis | |
| Additional Requirements | | |
| RSM 700 | Research Ethics | |
| Comprehensive Examination ³ | | |
| MGS Seminar ⁴ | | |
| MGS 701 | Seminar in Marine Geosciences | |
| THE GEOTOPICS Lecture Series ⁵ | | |
| Total Credit Hours | | 30 |

¹ Minimum of 24 course credits and 6 thesis credits.

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- In addition to fulfilling the general requirements, all MGS students must complete any two courses in the MGS 610 Series, including:
 - MGS 611 Earth Surface Processes
 - MGS 613 Introductory Geochemistry
 - MGS 771 Diagenesis of Carbonate Sediments may substitute for MGS 613.
 - MGS 614 Geophysics
 - MGS 682 Introduction to Seismology or MGS 635 Geological Hazards or MGS 723 Geodynamics may substitute for MGS 614.
- The intent of these course requirements is to ensure preparation across the range of subfields within MGS.
- If a student does not follow these requirements and performs poorly in one of the relevant subfields on the comprehensive exam, it may trigger a requirement to enroll in the respective course as a condition for further advancement in the MGS program.

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- All students who enroll in the MGS academic program starting in the Fall semester are required to take a comprehensive examination by the end of their third semester. Students who enroll in the Spring semester may be advised to take the comprehensive exam by the end of the following Spring semester.
- The purpose of the comprehensive examination is to evaluate the student's understanding of fundamental principles, reasoning skills, and to determine if any basic deficiencies are present in the student's background up to three semesters of classes.
- The examination will consist of a written part, which usually lasts about 6-8 hours, and an oral part, which lasts about 1 hour. The results of the written portion of the exam and performance of the oral exam determine the grade given by the examining board.
- The exam is organized in five blocks, each devoted to a distinct geoscience. The students choose to answer questions in four topics: two in the morning and two in the afternoon. The topics are:

- a. Geophysics and Earth Structure.
 - b. Plate Tectonics and Basin Formation.
 - c. Paleoceanography and Paleoclimatology.
 - d. Sedimentology and Stratigraphy.
 - e. Geochemistry and Petrology.
- For the M.S. degree candidate, the possible grades are **PASS** or **FAIL**.
 - A **FAIL** indicates there are gaps in understanding or knowledge of basic geological, geochemical, or geophysical principles. The student can retake the exam a second time in order to achieve a passing grade. If failure occurs on the second attempt, the student can be dismissed from the MGS program.
 - A **PASS** indicates there is acceptable or better comprehension of basic principles and allows the student to complete the M.S. degree. Following completion of the M.S. degree at UM, the student may apply for the Ph.D. program and is not required to retake the comprehensive examination, unless a period of more than four years has elapsed.
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- All MGS students are required to register for MGS 701 at least once and attend all meetings of the course throughout their tenure in the MGS program. Students are required to give presentations and actively participate in the course.
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- All MGS students are expected to attend the department weekly seminar THE GEOTOPICS.
 - The diverse lecture series presents recent and ongoing research by Rosenstiel School faculty and visiting scientists. These presentations help provide a broad, well-rounded view of research topics in the Earth sciences.

Sample Plan of Study

| | | |
|------------------------------|--|---------------------|
| Year One | | |
| Fall | | Credit Hours |
| MGS 611 | Earth Surface Processes | 3 |
| MGS 614, 682, 635, or 723 | Geophysics or Introduction to Seismology or Geological Hazards or Geodynamics | 3 |
| Approved Elective | | 3 |
| RSM 700 | Research Ethics | 0 |
| | Credit Hours | 9 |
| Spring | | |
| MGS 613 or 771 | Introductory Geochemistry or Diagenesis of Carbonate Sediments | 3 |
| MGS 701 | Seminar in Marine Geosciences | 1 |
| Approved Elective | | 3 |
| | Credit Hours | 7 |
| Summer | | |
| Approved Elective | | 2 |
| | Credit Hours | 2 |
| Year Two | | |
| Fall | | |
| Approved Elective | | 3 |
| Approved Elective | | 3 |
| | Credit Hours | 6 |
| Spring | | |
| MGS 810 | Master's Thesis | 3 |
| | Credit Hours | 3 |
| Summer | | |
| MGS 810 | Master's Thesis | 3 |
| | Credit Hours | 3 |
| | Total Credit Hours | 30 |

Mission

The mission of the MGS M.S. program is to prepare our students for either further academic education in a Ph.D. program or professional employment in geology and geophysics, environmental sciences, and petroleum geology. The program is based on two main elements: well-rounded coursework plus conduct of original research that leads to preparation of a publicly defended M.S. thesis.

Goals

To educate and train students to become the next generation of scientists conducting research and education in the areas of marine geology and geophysics, geochemistry, and environmental geosciences. The goal is to equip our students with the tools to apply their knowledge in either professional or academic careers, emphasizing on the former.

Student Learning Outcomes

- Students completing the MGS M.S. degree will demonstrate a broad comprehension of marine and Earth sciences. Students will understand the geological, geochemical, and geophysical processes that affect the Earth and its environment.
- Each student will prepare an original M.S. thesis that demonstrates their ability to critically evaluate scientific literature, comprehend previous knowledge on a topic, formulate testable hypotheses, and skillfully use available data and tools to advance the knowledge in that topic.
- Students will demonstrate good oral communication skills and be able to effectively communicate and defend their scientific findings to a peer audience.