

PH.D. IN MARINE GEOSCIENCES

Overview

During their Ph.D. 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/index.html>).

Curriculum Requirements

Code	Title	Credit Hours
The MGS Ph.D. degree requires 60 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		24
Dissertation Research		30
MGS 830	Doctoral Dissertation	
Required Examinations		
Comprehensive Examination ³		
Qualifying Examination ⁴		
Additional Requirements		
RSM 700	Research Ethics	
MGS Seminar ⁵		
MGS 701	Seminar in Marine Geosciences	
THE GEOTOPICS Lecture Series ⁶		
Educational Training Program (TA) ⁷		
RSM 771	Educational Training 1	
RSM 772	Educational Training 2	
RSM 773	Educational Training 3	
Total Credit Hours		60

¹ Minimum of 30 course credits and 12 dissertation 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 Ph.D. degree candidate, the possible grades are **PASS** or **FAIL**.
 - A **PASS** indicates that the student may proceed with additional course work, research proposal development, and preparation to take the qualifying examination.
 - A **FAIL** will require the student to retake the exam at a time to be determined by the Exam Committee and the MGS Academic Committee. This retake is scheduled no later than the end of the following semester. If failure occurs on the second attempt, the student can be dismissed from the MGS program.
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- Ph.D. students are required to take the qualifying examination by the end of the third year. The student should discuss scheduling of the exam with their Committee Chairperson and the dissertation committee members. The student must submit a completed dissertation proposal demonstrating their ability to formulate and test scientific hypotheses at least two weeks before the exam.
 - The purpose of the exam is to determine the students'
 - (a) Understanding the general principles of geology, geochemistry, and geophysics.
 - (b) Knowledge of the student's individual specialty.
 - (c) Knowledge of the student's peripheral and supporting disciplines.
 - The Dissertation Committee administers a written examination on the subjects outlined above. An oral examination may follow the written exam if necessary, to clarify answers, as judged by the Dissertation Committee.
 - Upon satisfactory completion of the qualifying exam, the student enters into candidacy for the Ph.D., provided the student meets all other requirements.
 - If the student fails the qualifying exam, the student may, at the discretion of the Dissertation Committee, be allowed another opportunity to be re-evaluated, but only up to the end of the following semester.
 - No "partial passes" of the qualifying exam are allowed.
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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.
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- Ph.D. students are expected to be a Teaching Assistant (TA) for two courses while pursuing their degree.
 - The mandatory TA program will include training of new TAs, evaluation of their performance, and recognition of excellence. The goal is to make the experience as valuable as possible for the TA, the faculty, and the students taking our courses.
 - A training session and two teaching opportunities are offered as courses in educational training (RSM 771, RSM 772, RSM 773). Students will be registered accordingly.
 - Specific requirements for TAs are outlined in the Rosenstiel School Student Handbook.

Sample Plan of Study

Year One		Credit Hours
Fall		
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 830	Doctoral Dissertation	1
MGS 701	Seminar in Marine Geosciences	1
Approved Elective		3
Credit Hours		8
Summer		
MGS 830	Doctoral Dissertation	2
Approved Elective		2
Credit Hours		4
Year Two		
Fall		
MGS 830	Doctoral Dissertation	1
Approved Elective		3
Credit Hours		4
Spring		
MGS 830	Doctoral Dissertation	1
Approved Elective		3
Credit Hours		4
Summer		
MGS 830	Doctoral Dissertation	4
Credit Hours		4
Year Three		
Fall		
MGS 830	Doctoral Dissertation	1
Approved Elective		4
RSM 771	Educational Training 1	0
RSM 772	Educational Training 2	0
Credit Hours		5
Spring		
MGS 830	Doctoral Dissertation	1
Approved Elective		3
RSM 773	Educational Training 3	0
Credit Hours		4
Summer		
MGS 830	Doctoral Dissertation	4
Credit Hours		4

Year Four			
Fall			
MGS 830	Doctoral Dissertation		4
Credit Hours			4
Spring			
MGS 830	Doctoral Dissertation		4
Credit Hours			4
Summer			
MGS 830	Doctoral Dissertation		4
Credit Hours			4
Year Five			
Fall			
MGS 830	Doctoral Dissertation		4
Credit Hours			4
Spring			
MGS 830	Doctoral Dissertation		4
Credit Hours			4
Summer			
MGS 830	Doctoral Dissertation		4
Credit Hours			4
Total Credit Hours			70

Mission

The mission of the MGS Ph.D. program is to educate and train students to become the next generation of scientists conducting research in and teaching geology and geophysics, geochemistry, and environmental geosciences. The program emphasizes coursework during the first year, then development of and independent conduct of original research that leads to preparation of peer-reviewed publications and a publicly defended Ph.D. dissertation.

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 latter.

Student Learning Outcomes

- Students in the MGS Ph.D. program will demonstrate a broad comprehension of marine and Earth science, and then use this knowledge to develop an independent scientific research topic of sufficient quality and originality to lead to a Ph.D. dissertation.
- Each student will prepare an original Ph.D. dissertation that demonstrates their ability to critically evaluate scientific literature, comprehend previous knowledge on a topic, formulate testable hypotheses, and independently use available data and tools to produce a significant original contribution on the topic.
- Students will demonstrate good oral communication skills and be able to effectively communicate and defend their scientific findings to a peer audience.