

M.P.S. IN MARINE BIOLOGY AND ECOLOGY

Overview

The MPS in Marine Biology and Ecology program offers two tracks: Marine Mammal Science and Tropical Marine Ecosystem Management.

Marine Mammal Science Track

Students in the Marine Mammal Science (<https://mps.rsmas.miami.edu/degree-tracks/marine-mammal-science/>) (MMS) track will prepare for employment in marine mammal management (including associated ecosystems), population assessments, acoustics, and care. Please see our track website (<https://mps.rsmas.miami.edu/degree-tracks/marine-mammal-science/>) for more information about this program.

Tropical Marine Ecosystem Management Track

The Tropical Marine Ecosystem (<https://mps.rsmas.miami.edu/degree-tracks/tropical-marine-ecosystem-management/>) (TME) track within the Department of Marine Biology and Ecology (<https://marine-biology-ecology.rsmas.miami.edu/>) at the Rosenstiel School of Marine, Atmospheric and Earth Science, provides students with advanced training in the theoretical aspects of tropical marine ecology, as well as the practical aspects needed to begin a career in this field. Please refer to the MPS website (<https://mps.rsmas.miami.edu/degree-tracks/tropical-marine-ecosystem-management/>) for more information about the TME track.

Admission Requirements

Prerequisites:

1. Bachelor of Science degree (B.S.) or Bachelor of Arts degree (B.A.)
2. One year of General Biology + General Biology Labs
3. One year of General Chemistry
4. At least one semester of Calculus
5. 9 additional credits in natural science (Research in these fields may, in some cases, substitute for coursework hours.)

Note to students: Deficiencies in required coursework may be considered on a case by case basis for otherwise highly qualified students or those demonstrating experience with these skills.

All application requirements are available here (<https://mps.rsmas.miami.edu/prospective-students/admissions/>).

Curriculum Requirements

Marine Mammal Science Track

Code	Title	Credit Hours
MBE 604	Biology of Marine Mammals	3
RSM 612 or EVR 624	Statistics for Marine Scientists Statistics and Data Analysis for Environmental Science and Policy	3
EVR 670	Conservation and Management of Marine Mammals	3
EVR 660 & EVR 661	Introduction to Marine Geographic Information Systems and Introduction to Marine Geographic Information Systems - Laboratory	3
MBE 605	Marine Mammal Disease and Medicine	3
MBE 746 or EVR 645	Marine Population Biology: Processes and Modeling Marine Population Assessment Surveys and Analysis	3
OCE 651	Applied Ocean Acoustics and Marine Mammals	3
MBE 805	MPS Internship	3-6
Electives		6
Total Credit Hours		30

¹ Enrollment in 2 - 6 internship credits required during a student's time in MPS. Completion of less than 2 internship credits must be approved by MPS Director. Students may enroll in more than 6 internship credits with the approval of the Program Director. Typically 2 semesters are needed to complete all aspects of the internship phase of MPS.

Elective Options

Students may take any elective on the Marine Campus with the consent of their faculty advisor. Below are a few examples of courses past students in this program used as electives.

Code	Title	Credit Hours
MBE 710	Advanced Marine Mammal Biology	3
MBE 606	Procedures in Marine Mammal Health and Disease	1
MBE 607	Marine Mammal Applied Behavior Analysis and Managed Care	3
MBE 608	Discussions of Marine Mammal Welfare	1
MBE 632	Marine Mammal Research Techniques	3
MBE 716	Bayesian Statistics for Marine Scientists	3
EVR 720	Coastal Law and Policy	3
EVR 620	Environmental Law and Policy	3
MBE 678	Evolutionary Genetics	3
POL 631	Global Environment Politics	3
EVR 710	International Ocean Law and Governance	3
EVR 616	Ocean Policy	3
RSM 710	The Physical Environment of Marine Organisms	3
EVR 601	Political Ecology of Marine Management	3
RSM 667 or RSM 664	Motorboat Operator Certification Course Scientific Small Boating	1

Curriculum Requirements

Tropical Marine Ecosystem Management Track

Code	Title	Credit Hours
Ecology Requirement		
MBE 615	Tropical Marine Ecology	3
Statistics Requirement		
RSM 612 or EVR 624	Statistics for Marine Scientists Statistics and Data Analysis for Environmental Science and Policy	3
Policy Requirement		
EVR 620 or EVR 720 or EVR 616 or EVR 710 or EVR 631	Environmental Law and Policy Coastal Law and Policy Ocean Policy International Ocean Law and Governance Marine and Coastal Protected Area Theory, Planning, Management, and Issues	3
Field Requirement ¹		
MBE 621 or MBE 614 or MBE 637 or MBE 644 or MBE 641	Field Techniques and Instrumentation in Tropical Marine Ecology Tropical Marine Biology Data Manipulation and Presentation for Marine Ecologists Tropical Coastal Restoration Reef Restoration Techniques	3
Technical Skills Requirement ²		
EVR 660 & EVR 661	Introduction to Marine Geographic Information Systems and Introduction to Marine Geographic Information Systems - Laboratory	3
EVR 610	Environmental Planning and the Environmental Impact Statement	3
Other Requirements		
RSM 600	Introduction to Research Diving Techniques ³	3
RSM 667 or RSM 664	Motorboat Operator Certification Course ³ Scientific Small Boating	1-2
MBE 746 or MBE 638 or EVR 629 or MBE 623 or MBE 618	Marine Population Biology: Processes and Modeling * Tropical Microbial Ecology Biology, Ecology, and Management of Mangrove Ecosystems Marine Parasite Ecology Reef Coral Biology, Ecology, and Conservation	3

or RSM 601	Scientific Freediving	
or EVR 634	Shark Behavioral Ecology and Conservation	
Internship Requirement		
MBE 805	MPS Internship ⁴	4-5
Total Credit Hours		30

* Courses listed are suggestions. Students may choose other electives with the approval of their academic advisor and/or course instructor if special permission is required.

¹ Students may choose another field course in MBE or EVR with the approval of their academic advisor.

² Students may take both courses if desired.

³ Enrollment is strongly encouraged. May be substituted for another elective with the approval of their academic advisor.

⁴ Enrollment in 2 - 6 internship credits required during a student's time in MPS. Completion of less than 2 internship credits must be approved by MPS Director. Typically 2 semesters are needed to complete all aspects of the internship phase of MPS.

Additional Elective Options

Students may take any elective on the Marine Campus with the consent of their faculty advisor. Below are a few examples of courses past students in this program used as electives.

Code	Title	Credit Hours
MBE 614	Tropical Marine Biology	3
MBE 678	Evolutionary Genetics	3
MBE 643	Ecology, Conservation, and Ecotourism in the Galapagos II - Field	1
MBE 704	Biological Oceanography	3
MBE 716	Bayesian Statistics for Marine Scientists	3
EVR 601	Political Ecology of Marine Management	3
EVR 602	Economics of Natural Resources	3
EVR 604	Fieldwork in Coastal Management: Tourism, Conservation, and Development	3
EVR 620	Environmental Law and Policy	3
EVR 610	Environmental Planning and the Environmental Impact Statement	3
EVR 614	Underwater Site Mapping and Visualization Techniques	3
EVR 616	Ocean Policy	3
EVR 625	Fisheries Socioeconomics and Management	3
EVR 626	Submerged Cultural Resource Management	3
EVR 662	Intermediate Spatial Analysis	3
EVR 710	International Ocean Law and Governance	3
EVR 720	Coastal Law and Policy	3
RSM 633	Survey of Telemetry for Animal Movement Research	1
RSM 645	Science Communication: Professional Writing	1
RSM 646	Presentation Boot Camp	1
RSM 649	Advanced Presentation Boot Camp	1
RSM 710	The Physical Environment of Marine Organisms	3
POL 631	Global Environment Politics	3
BIL 623	Advanced Biology of Marine Invertebrates	4

Suggested Plan of Study

Marine Mammal Science Track

Year One		Credit Hours
Fall		
MBE 604	Biology of Marine Mammals	3
EVR 660 & EVR 661	Introduction to Marine Geographic Information Systems and Introduction to Marine Geographic Information Systems - Laboratory	3
EVR 670	Conservation and Management of Marine Mammals	3

RSM 612 or EVR 624	Statistics for Marine Scientists or Statistics and Data Analysis for Environmental Science and Policy	3
Credit Hours		12
Spring		
MBE 605	Marine Mammal Disease and Medicine	3
MBE 746 or EVR 645	Marine Population Biology: Processes and Modeling or Marine Population Assessment Surveys and Analysis	3
OCE 651	Applied Ocean Acoustics and Marine Mammals	3
MBE 607	Marine Mammal Applied Behavior Analysis and Managed Care *	3
Credit Hours		12
Summer		
MBE 632	Marine Mammal Research Techniques *	3
MBE 805	MPS Internship ¹	2-6
Credit Hours		6
Total Credit Hours		30

* or Elective

¹ Enrollment in 2 - 6 internship credits required during a student's time in MPS. Completion of less than 2 internship credits must be approved by MPS Director. Students may enroll in more than 6 internship credits with the approval of the Program Director. Typically 2 semesters are needed to complete all aspects of the internship phase of MPS.

Suggested Plan of Study

Tropical Marine Ecosystem Management Track

Year One		
Fall		Credit Hours
MBE 615	Tropical Marine Ecology	3
RSM 600	Introduction to Research Diving Techniques * ¹	3
RSM 667 or 664	Motorboat Operator Certification Course * ¹ or Scientific Small Boating	1
RSM 612 or EVR 624	Statistics for Marine Scientists or Statistics and Data Analysis for Environmental Science and Policy	3
EVR 620, 720, or 616	Environmental Law and Policy ² or Coastal Law and Policy or Ocean Policy	3
Credit Hours		13
Spring		
MBE 621	Field Techniques and Instrumentation in Tropical Marine Ecology ³	3
EVR 660 & EVR 661 or 610	Introduction to Marine Geographic Information Systems ¹ or Environmental Planning and the Environmental Impact Statement	3
MBE 746	Marine Population Biology: Processes and Modeling ⁴	3
EVR 610	Environmental Planning and the Environmental Impact Statement ⁴	3
Credit Hours		12
Summer		
MBE 805	MPS Internship ⁵	2-6
Credit Hours		5
Total Credit Hours		30

* Enrollment is strongly encouraged. May be substituted for another elective with the approval of their academic advisor.

¹ Can be taken in Fall or Spring

² Additional Policy Options: EVR 631, EVR 710

³ Additional Field Options: MBE 614, MBE 637, MBE 644, MBE 641. Students may choose another field course in MBE or EVR with the approval of their academic advisor.

⁴ Suggested Options: MBE 638, MBE 623, MBE 618, EVR 634, EVR 629, RSM 601. Students may choose other electives with the approval of their academic advisor and/or course instructor if special permission is required.

⁵ Enrollment in 2 - 6 internship credits required during a student's time in MPS. Completion of less than 2 internship credits must be approved by MPS Director. Typically 2 semesters are needed to complete all aspects of the internship phase of MPS.

Mission

Marine Mammal Science Track

The mission of the Marine Mammal Science (MMS) track is to prepare students for employment in marine mammal management (including associated ecosystems), population assessments, acoustics, and care. Coursework integrates topics such as marine mammal medicine and pathology, medical diagnostics and laboratory analysis, population assessment and management, state and federal regulations, applied ocean acoustics, research, education, and applied behavior analysis. The MMS track provides opportunities for students to interact with medical, training, and research experts in our community, as well as conduct an internship at one of many marine mammal rehab, managed care, or research facilities. As part of the practical training incorporated into the Marine Mammal Science curriculum, this track provides opportunities and training for students to participate in mark-recapture surveys, public education, wild health assessments, behavior analysis and modification studies, clinical care and diagnostics, necropsies, and regional and national conferences.

Tropical Marine Ecosystem Management Track

The mission of the Tropical Marine Ecosystem (<https://mps.rsmas.miami.edu/degree-tracks/tropical-marine-ecosystem-management/>) (TME) track is to prepare graduates for technical positions in marine conservation, management, and marine ecosystem science at one of a number of state and federal agencies, institutions, and NGOs by providing students with advanced training in the theoretical and practical aspects of tropical marine ecology. This program introduces students to theoretical aspects of nearshore, benthic ecosystems common to tropical and subtropical regions worldwide (coral reefs, seagrasses, and mangroves) and emphasizes threats facing these ecosystems. Practical aspects of the course exposes students to field methods and techniques, taxonomy and identification of common vertebrates, invertebrates, algae and marine plants, GIS and remote sensing of shallow water marine environments, scientific diving (through the American Academy of Underwater Sciences), and small boat handling (through the Department of the Interior's Motorboat Operator Certification Course).