RSMAS GENERAL (RSM)

RSM 500. Research Diving Techniques. 3 Credit Hours.
This course is designed to introduce students to the practices and policies of scientific diving. The object is to prepare students to use SCUBA as a research tool for the marine sciences. The course content will qualify students as RESEARCH DIVERS under the UM/RSMAS Scientific Diving Program and will meet the standards set by the American Academy of Underwater Sciences (AAUS).
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

RSM 510. Environmental Ethics. 3 Credit Hours.
This course will introduce students to a variety of key issues and concepts in environmental ethics. The course will be a joint scientific and philosophic collaboration, exploring the ethical dimensions of controversial and emerging issues in biotechnology and the environment. After students are exposed to the scientific background of various actual case studies focusing on current environmental and social impact, the ethical and philosophical issues raised by the discussions will be explored using the tools and methods of analytic philosophy. The course will develop the student's ability to construct and evaluate philosophical arguments in the field of environmental ethics, and to reason philosophically on numerous questions in contemporary applied ethics.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

RSM 512. Statistics for Environmental Management. 3 Credit Hours.
This course covers the statistical theory, tools, and methods required for management analysis and improvement, emphasizing marine science applications.
Components: THI.
Grading: GRD.
Typically Offered: Fall.

RSM 513. Statistical Modeling of Extreme and Rare Events. 3 Credit Hours.
The course will focus on rare events and extreme values observed in nature. In particular, students will learn: advanced statistical methods of data analysis, as well as concepts of probability and predictability; statistical modeling of rare and extreme events; and applications of these advanced techniques to real atmospheric and oceanic data. Must have taken RSM 512/RSM 612 or equivalent; or calculus; or permission from instructor.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 520. Climate and Society. 3 Credit Hours.
This course is designed to provide students from different disciplinary backgrounds with an overview of physical processes, general concepts and policy debates surrounding climate issues.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 521. Object-Oriented Programming and Agent-Based Modelling. 3 Credit Hours.
Hands-on training in object-oriented programming using Java, including Java statistical packages, and in the development of agent-based and individual-based simulation models for ecological, physiological, social, economic and physical sciences. Course includes introductions to cellular automata and models based on social and behavioral networks. No prior programming experience required.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 546. Presentation Bootcamp. 1 Credit Hour.
This course focuses on presenting scientific concepts and research findings more effectively to both scientific/technical audiences and the general public.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

RSM 547. Methods for Marine and Atmospheric Education. 3 Credit Hours.
Will introduce students to recent national science and engineering, climate, ocean education standards, and best curricula and instructional approaches for teaching and learning science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.
RSM 548. Management and Leadership in Marine and Atmospheric Science. 3 Credit Hours.
The goal of this course is to become an effective leader/manager while leveraging the individual strengths of a team in the marine and atmospheric field. The course will use leadership theories and case studies to understand how decisions affect outcomes. Students will develop the ability to manage teams effectively amidst a changing world. Students discuss literature and case studies to explore the foundations of effective leadership and support task triage, decision-making, shared mental models, and appropriate executive styles. The course will introduce students to recent national science and engineering, climate, and ocean standards and best approaches when it comes to managing a staff in the marine and atmospheric sciences. The course will also focus on identifying and analyzing marine and atmospheric leadership and effectively communicating scientific topics to different audiences.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 560. Investigating Nature through Science Teacher Active Research (INSTAR) in Physical Science. 2 Credit Hours.
This is a graduate level marine science course that provides a hands-on approach to education focused on geological and meteorological research in South Florida environment. The course provides training in marine science content, field techniques, state-of-the-art field, computer technology, and science educational reform measures. Participants work collaboratively with marine and atmospheric scientists to bring cutting edge marine science content and research to the classroom focusing on the following coastal themes: geology, hydrology and meteorology. The course will be applicable to all graduate and qualified undergraduate marine science students, per-service teachers in colleges of education, and in-service teachers in school systems throughout the country.
Components: LEC.
Grading: GRD.
Typically Offered: Summer.

RSM 561. INSTAR for Physical Sciences Follow-up. 1 Credit Hour.
This is a follow-up course for participants in MGG 560 and is designed to test the application of the methods learned in MGG 560 to the teaching of high school students. Participants are expected to show evidence of teaching material learned in MGG 560.
Components: LEC.
Grading: GRD.
Typically Offered: Summer.

RSM 562. Investigating Nature through Science Teacher Active Research in Biological Science. 2 Credit Hours.
This is a graduate level marine science course that provides a hands-on approach to education focused on marine science research and technology in South Florida coastal environments. The course provides training in marine science content, field techniques, state-of-the-art field and computer technology, and science educational reform measures. Participants work collaboratively with marine scientists to bring cutting edge marine science content and research to the classroom focusing on the following coastal themes: coral reefs and marine fisheries. The course will be applicable to all graduate and qualified undergraduate marine science students, per-service teachers in colleges of education, and in-service teachers in school systems throughout the country.
Components: LEC.
Grading: GRD.
Typically Offered: Summer.

RSM 563. INSTAR Biological Sciences Follow-up. 1 Credit Hour.
This is a follow-up course for participants in RSM 562 and is designed to test the application of the methods learned in RSM 562 to the teaching of high school students. Participants are expected to show evidence of teaching material learned in RSM 562.
Components: LEC.
Grading: GRD.
Typically Offered: Summer.

RSM 565. Fish Ecology and Oceanography. 3 Credit Hours.
This course is intended to introduce students to key biological, ecological, oceanographic, and climatic processes of direct relevance to fishery species, with a view toward development of an ecosystem perspective.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

RSM 566. Polar Science. 3 Credit Hours.
The course covers the physical, chemical and biological components of the polar oceans, atmosphere and coastal regions. The interactions between ocean, ice, atmosphere and land are discussed in detail not only in terms of local relationships, with links to the climate system.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.
RSM 567. Motorboat Operator Certificate Course. 1-2 Credit Hours.
The MOCC course was developed and formalized by the United States Department of the Interior in the early 1990’s. The course is designed to give students broad academic knowledge and practical training running small boats (Boats 26’ in length or shorter). In addition to the relevant theory, students will get hands on training trailering small boats, launching and loading at boat ramps, slow and high speed maneuvering, Marline Spike (knot tying), as well as in water emergency training and the use of flares and pyrotechnics. The MOCC certification is the training standard for occupational small boating and used by government organizations, public and private research organizations, public aquaria, etc. The certification is a marketable skill for students moving ahead in their careers in marine science.

Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 568. Techniques in Respirometry, Swim Performance and Behavior of Aquatic Organisms. 2 Credit Hours.
The objectives of this course is to give participants an understanding and overview of methods and hands-on with modern equipment. The emphasis of the course will be on marine fish, but the techniques can be used for freshwater fish and aquatic invertebrates as well. The course is based on lectures, lab exercises and plenary discussions. The final part of the course constitutes a written project based on data collected during the week. Requisite: Senior Status and Prerequisite: BIL 160.

Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 570. Carbon and Climate. 3 Credit Hours.
This course is designed to provide students from different disciplinary backgrounds with an overview of the underlying processes, concepts, and policy debates surrounding the issue of carbon emissions and climate change. Individual faculty from RSMAS and elsewhere will lecture on cutting-edge research areas. Topics covered include: climate modeling; and climate policy.

Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

RSM 571. Special Topics. 1-4 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.

Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 572. Special Topics. 1-4 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.

Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 573. Special Topics. 1-3 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.

Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 574. Special Topics. 1-3 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.

Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 575. Special Topics. 1-3 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.

Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 576. Special Topics. 1-4 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.

Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.
RSM 577. Special Topics. 1-4 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 578. Special Topics. 1-4 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 600. Research Diving Techniques. 3 Credit Hours.
This course is designed to introduce students to the practices and policies of scientific diving. The object is to prepare students to use SCUBA as a research tool for the marine sciences. The course content will qualify students as RESEARCH DIVERS under the UM/RSMAS Scientific Diving Program and will meet the standards set by the American Academy of Underwater Sciences (AAUS).
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

RSM 611. Principles of Mass Spectrometry and Applications to Marine, Atmospheric, and Environmental Science. 3 Credit Hours.
This course goes in depth into the principles and uses of mass spectrometry. It is intended for graduate students who use mass spectrometry to conduct their research. Concepts taught will include the components of mass spectrometers (vacuum systems, ionization methods, mass analyzers, detectors), different types of mass spectrometers and their uses, and coupling chromatography to mass spectrometry. Each student will be required to give presentations on new advances in mass spectrometry and an in-depth presentation on a mass spectrometer that they use and new findings in the literature relevant to their technique and personal research.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 612. Statistics for Environmental Management. 3 Credit Hours.
This course covers the statistical theory, tools, and methods required for management analysis and improvement, emphasizing marine science applications.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

RSM 613. Statistical Modeling of Extreme and Rare Events. 3 Credit Hours.
The course will focus on rare events and extreme values observed in nature. In particular, students will learn: advanced statistical methods of data analysis, as well as concepts of probability and predictability, statistical modeling of rare and extreme events; and applications of these advanced techniques to real atmospheric and oceanic data.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 620. Climate and Society. 3 Credit Hours.
This course is designed to provide students from different disciplinary backgrounds with an overview of physical processes, general concepts and policy debates surrounding climate issues.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 621. Object-Oriented Programming and Agent-Based Modelling. 3 Credit Hours.
Hands-on training in object-oriented programming using Java, including Java statistical packages, and in the development of agent-based and individual-based simulation models for ecological, physiological, social, economic and physical sciences. Course includes introductions to cellular automaton models and models based on social and behavioral networks. No prior programming experience required.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.
RSM 622. Data Management for Scientists. 2 Credit Hours.
This course will cover techniques used in data profiling, filtering, and archiving. Online tools will be used for elaborating data management plans and well-established database techniques for manipulating data. Participants will develop data management plans and introduce techniques for data manipulation, such as database design and implementation concepts, query coding, and data cleaning/importing/exporting. Course participants will be exposed to theoretical concepts and engage in hands-on activities throughout the semester. Participants are encouraged to bring their own data for processing or asked to select a dataset from the many online data repositories.

Components: LEC.
Grading: SUS.
Typically Offered: Fall.

RSM 646. Presentation Bootcamp. 1 Credit Hour.
This course focuses on presenting scientific concepts and research findings more effectively to both scientific/technical audiences and the general public.

Components: LEC.
Grading: GRD.
Typically Offered: Fall.

RSM 647. Methods for Marine and Atmospheric Education. 3 Credit Hours.
Will introduce students to recent national science and engineering, climate, ocean education standards, and best curricula and instructional approaches for teaching and learning science.

Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

RSM 648. Management and Leadership in Marine and Atmospheric Science. 3 Credit Hours.
The goal of this course is to become an effective leader/manager while leveraging the individual strengths of a team in the marine and atmospheric field. The course will use leadership theories and case studies to understand how decisions affect outcomes. Students will develop the ability to manage teams effectively amidst a changing world. Students discuss literature and case studies to explore the foundations of effective leadership and support task triage, decision-making, shared mental models, and appropriate executive styles. The course will introduce students to recent national science and engineering, climate, and ocean standards and best approaches when it comes to managing a staff in the marine and atmospheric sciences. The course will also focus on identifying and analyzing marine and atmospheric leadership and effectively communicating scientific topics to different audiences.

Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 650. Data Management in the Research Environment. 2 Credit Hours.
This course covers theoretical and practical approaches to research data management in academic contexts. Theoretical aspects include overviews of information science, data policy and data governance. The practical approaches include skills and best practices in research data management, and basic command line computing for data analysis and visualization (python and R). The purpose of the course is to increase research productivity, to enable data stewardship, and to help the student exceed data management expectations/requirements in the research environment. This is a practical methods course with tangible products; students produce a data management plan for their specific research endeavor, or prepare and deposit data into a discipline specific repository (other projects subject to instructor approval will be considered). The class is open to all graduate students in all disciplines. There are no prerequisites and while the course is designed for the first or second year of a graduate program, students who are further along will benefit as well.

Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

RSM 660. Investigating Nature through Science Teacher Active Research (INSTAR) in Physical Science. 2 Credit Hours.
This is a graduate level marine science course that provides a hands-on approach to education focused on geological and meteorological research in South Florida environment. The course provides training in marine science content, field techniques, state-of-the-art field, computer technology, and science educational reform measures. Participants work collaboratively with marine and atmospheric scientists to bring cutting edge marine science content and research to the classroom focusing on the following coastal themes: geology, hydrology and meteorology. The course will be applicable to all graduate and qualified undergraduate marine science students, per-service teachers in colleges of education, and in-service teachers in school systems throughout the country.

Components: LEC.
Grading: GRD.
Typically Offered: Summer.
RSM 661. INSTAR for Physical Sciences Follow-up. 1 Credit Hour.
This is a follow-up course for participants in MGG 560 and is designed to test the application of the methods learned in MGG 560 to the teaching of high school students. Participants are expected to show evidence of teaching material learned in MGG 560.
Components: LEC.
Grading: GRD.
Typically Offered: Summer.

RSM 662. Investigating Nature through Science Teacher Active Research in Biological Science. 2 Credit Hours.
This is a graduate level marine science course that provides a hands-on approach to education focused on marine science research and technology in South Florida coastal environments. The course provides training in marine science content, field techniques, state-of-the-art field and computer technology, and science educational reform measures. Participants work collaboratively with marine scientists to bring cutting edge marine science content and research to the classroom focusing on the following coastal themes: coral reefs and marine fisheries. The course will be applicable to all graduate and qualified undergraduate marine science students, per-service teachers in colleges of education, and in-service teachers in school systems throughout the country.
Components: LEC.
Grading: GRD.
Typically Offered: Summer.

RSM 663. INSTAR Biological Sciences Follow-up. 1 Credit Hour.
This is a follow-up course for participants in RSM 562 and is designed to test the application of the methods learned in RSM 562 to the teaching of high school students. Participants are expected to show evidence of teaching material learned in RSM 562.
Components: LEC.
Grading: GRD.
Typically Offered: Summer.

RSM 665. Fish Ecology and Oceanography. 3 Credit Hours.
This course is intended to introduce students to key biological, ecological, oceanographic, and climatic processes of direct relevance to fishery species, with a view toward development of an ecosystem perspective.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

RSM 666. Polar Science. 3 Credit Hours.
The course covers the physical, chemical and biological components of the polar oceans, atmosphere and coastal regions. The interactions between ocean, ice, atmosphere and land are discussed in detail not only in terms of local relationships, with links to the climate system.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

RSM 667. Motorboat Operator Certificate Course. 1-2 Credit Hours.
The MOCC course was developed and formalized by the United States Department of the Interior in the early 1990's. The course is designed to give students broad academic knowledge and practical training running small boats (Boats 26' in length or shorter). In addition to the relevant theory, students will get hands on training trailer ing small boats, launching and loading at boat ramps, slow and high speed maneuvering, Marine Spike (knot tying), as well as in water emergency training and the use of flares and pyrotechnics. The MOCC certification is the training standard for occupational small boating and used by government organizations, public and private research organizations, public aquaria, etc. The certification is a marketable skill for students moving ahead in their careers in marine science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 668. Techniques in Respirometry, Swim Performance and Behavior of Aquatic Organisms. 2 Credit Hours.
The objectives of this course is to give participants an understanding and overview of methods and hands-on with modern equipment. The emphasis of the course will be on marine fish, but the techniques can be used for freshwater fish and aquatic invertebrates as well. The course is based on lectures, lab exercises and plenary discussions. The final part of the course constitutes a written project based on data collected during the week.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 670. Carbon and Climate. 3 Credit Hours.
This course is designed to provide students from different disciplinary backgrounds with an overview of the underlying processes, concepts, and policy debates surrounding the issue of carbon emissions and climate change. Individual faculty from RSMAS and elsewhere will lecture on cutting-edge research areas. Topics covered include: climate modeling; and climate policy.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.
RSM 671. Special Topics. 1-4 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 672. Special Topics. 1-4 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 673. Special Topics. 1-3 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 674. Special Topics. 1-3 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 675. Special Topics. 1-3 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 676. Special Topics. 1-4 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 677. Special Topics. 1-4 Credit Hours.
Lectures and research projects in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 700. Research Ethics. 0 Credit Hours.
The NIH Guide for Grants and Contracts stipulates that Institutions receiving support for National Research Service Award Training Grants are required to develop a program in the principles of Scientific Integrity. The University of Miami Rosenstiel School has chosen to respond to this requirement with this course. This course must be taken during the first semester in the Department or Program. This is a six-hour course and will be given in two sessions of three hours each.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

RSM 710. The Physical Environment of Marine Organisms. 3 Credit Hours.
The fluid environment of the sea influences the growth, distribution, and survival of marine organisms. The physical processes that affect organisms occur in space and time, ranging from the molecular properties of water to basin-wide linkages between oceanic regime and climate shifts are discussed. Course emphasis is placed on how physical processes affect the life of plankton to nekton. Students are required to present reviews based on the literature.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.
RSM 720. Object-oriented Programming and Agent-based Modeling. 3 Credit Hours.
Basics of object-oriented programming using Java, including Java statistical packages, and hands-on development of agent-based simulation models for social, economic, biological and physical sciences. Includes introductions to automaton and individual-based models.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

RSM 771. Educational Training 1. 0 Credit Hours.
Educational training workshop and presentations.
Components: WKS.
Grading: SUS.
Typically Offered: Fall & Spring.

RSM 772. Educational Training 2. 0 Credit Hours.
First semester of educational training.
Components: WKS.
Grading: SUS.
Typically Offered: Fall & Spring.

RSM 773. Educational Training 3. 0 Credit Hours.
Second semester of educational training.
Components: WKS.
Grading: SUS.
Typically Offered: Fall & Spring.

RSM 774. Advanced Studies. 1-3 Credit Hours.
Supervised study in areas of special interest to graduate students.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 775. Advanced Studies. 1-3 Credit Hours.
Supervised study in areas of special interest to graduate students.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 780. Directed Readings. 1-3 Credit Hours.
Directed readings in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

RSM 781. Directed Readings. 1-3 Credit Hours.
Directed readings in special topics related to Marine and Atmospheric Science.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.