

# RSMAS GENERAL (RSM)

---

## **RSM 500. Introduction to Research Diving Techniques. 3 Credit Hours.**

This course introduces students to the practices and policies of scientific diving. The goal is to prepare students to use SCUBA as a research tool for the marine sciences and acquire the skillset that will allow them to be competent and efficient scientific divers when conducting underwater data collection. Topics covered include physics, physiology, dive tables, dive planning, accident management and rescues, project planning, etc. Skillsets covered include buoyancy control/stability/trim, line reels, surface marker buoy deployment, rigging and lift bag usage, full face mask communications, diver propulsion vehicles, low visibility training, and federal competency skills tests. The course content may qualify students as scientific divers under the auspices of the UM/RSMAS Scientific Diving Program and will meet the standards set by the American Academy of Underwater Sciences (AAUS). These standards include 100 hours of course training and a minimum of 12 dives during the scientific diving course. Students that qualify will be approved UM scientific divers. Students who enroll in the course must be certified as a recreational diver with a major recreational certification agency, pass a swim test, and complete a diving physical exam. Certain medical conditions may disqualify a student from scientific diving. Conditions include, for example, asthma, seizures, spontaneous pneumothorax, etc. Please reference the NOAA Diving Medical Standards for additional details and other potential disqualifications. Before enrollment, please contact the UM Diving Safety Office for questions relating to these potential disqualifying medical conditions.

Enrollment Condition: Senior Standing.

**Components:** LEC.

**Grading:** SUS.

**Typically Offered:** Fall & Spring.

## **RSM 501. Scientific Freediving. 4 Credit Hours.**

This course is designed to provide students who have an interest in conducting underwater research with the skills and competencies to be certified as a University of Miami Scientific Freediver in accordance with the Standards for Scientific Freediving. This course will discuss and evaluate topics related to the history and evolution of freediving and the common techniques; marine mammals and human physiology in relation to freediving activities and adaptations; safety and problem management in the aquatic realm; the practical application of underwater research skills, techniques, and methodologies. Prerequisites and Course Safety Enrollment Requirements: Medical certification of fitness; General water skills test; Have a high degree of comfort being in and under the water – both in confined water (pool) and open water (ocean); Obtain personal equipment for freediving activities. Contact the instructor if you have any questions about the enrollment requirements.

Enrollment Condition: Senior Standing.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

## **RSM 512. Statistics for Marine Scientists. 3 Credit Hours.**

This course is intended for students in the life sciences and environmental sciences who are interested in learning how to use and apply statistics. The course will cover basic concepts of probability and statistics, as well as a number of useful statistical methodologies that are used in biology and environmental science, such as regression, analysis of variance, and univariate non-parametric statistics. The course will include homework assignments, which the students will conduct using both Excel and the free statistics package R (<http://cran.r-project.org/>), so that they will get hands-on experience with the methodology.

Enrollment Condition: Senior Standing.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

## **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 530. Elasmobranch Field Research Skills. 3 Credit Hours.**

This field course introduces students to essential principles of responsible fieldwork with elasmobranchs (sharks and rays). Through a combination of readings, structured discussions of primary literature, guest lectures, opportunities to learn about and contribute to gear construction, practice with the administrative requirements for working with animals, including IACUC and state and federal permitting processes, and hands-on experience with elasmobranchs, students will leave with a strong understanding of the technical, administrative, and practical aspects of best practices for conducting field research with sharks and rays.

Senior Standing.

**Components:** FLD.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**RSM 540. DEIA in Marine Science Broader Impacts: Theory & Reflection. 1 Credit Hour.**

This unique course will focus on various concepts related to the theory of equity, diversity, inclusion, and accessibility, as well as practical examples and helpful strategies to ensure DEIA in broader impacts and everyday lives. We will emphasize meaningful conversations about DEIA and strategies to both address inequities as individuals and educators and ensure effective science communication and inclusion.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**RSM 541. Broadening Participation in Marine Science. 3 Credit Hours.**

This unique course will focus on various concepts related to broadening participation of underrepresented minorities in marine science and conservation. During the course, students will learn how to effectively implement the fundamental principles, goals, and practice of integrative informal STEM education and broader impacts by developing, coordinating, and hosting an outreach event for K-12 students in under-served schools.

Requisite: Senior Standing.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**RSM 546. Presentation Boot Camp. 1 Credit Hour.**

This course focuses on presenting scientific concepts and research findings more effectively to both technical audiences and the general public.

Enrollment Condition: Senior Standing.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**RSM 547. Methods for Marine and Atmospheric Education. 3 Credit Hours.**

This course focuses on curriculum and instructional methods for teaching marine and atmospheric content in formal and informal settings. The course will introduce students to recent national science and engineering, climate, and ocean education standards and best curricula and instructional approaches for teaching and learning science. The course will also focus on identifying and analyzing research on marine and atmospheric education and effectively communicating scientific topics to different audiences.

Enrollment Condition: Senior Standing.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**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 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.

Enrollment Condition: Senior Standing.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**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 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:** 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 600. Introduction to Research Diving Techniques. 3 Credit Hours.**

This course introduces students to the practices and policies of scientific diving. The goal is to prepare students to use SCUBA as a research tool for the marine sciences and acquire the skillset that will allow them to be competent and efficient scientific divers when conducting underwater data collection. Topics covered include physics, physiology, dive tables, dive planning, accident management and rescues, project planning, etc. Skillsets covered include buoyancy control/stability/trim, line reels, surface marker buoy deployment, rigging and lift bag usage, full face mask communications, diver propulsion vehicles, low visibility training, and federal competency skills tests. The course content may qualify students as scientific divers under the auspices of the UM/RSMAS Scientific Diving Program and will meet the standards set by the American Academy of Underwater Sciences (AAUS). These standards include 100 hours of course training and a minimum of 12 dives during the scientific diving course. Students that qualify will be approved UM scientific divers. Students who enroll in the course must be certified as a recreational diver with a major recreational certification agency, pass a swim test, and complete a diving physical exam. Certain medical conditions may disqualify a student from scientific diving. Conditions include, for example, asthma, seizures, spontaneous pneumothorax, etc. Please reference the NOAA Diving Medical Standards for additional details and other potential disqualifications. Before enrollment, please contact the UM Diving Safety Office for questions relating to these potential disqualifying medical conditions.

**Components:** LEC.

**Grading:** SUS.

**Typically Offered:** Fall & Spring.

**RSM 601. Scientific Freediving. 4 Credit Hours.**

This course is designed to provide students who have an interest in conducting underwater research with the skills and competencies to be certified as a University of Miami Scientific Freediver in accordance with the Standards for Scientific Freediving. This course will discuss and evaluate topics related to the history and evolution of freediving and the common techniques; marine mammals and human physiology in relation to freediving activities and adaptations; safety and problem management in the aquatic realm; the practical application of underwater research skills, techniques, and methodologies. **Prerequisites and Course Safety Enrollment Requirements:** Medical certification of fitness; General water skills test; Have a high degree of comfort being in and under the water – both in confined water (pool) and open water (ocean); Obtain personal equipment for freediving activities. Contact the instructor if you have any questions about the enrollment requirements.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**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 Marine Scientists. 3 Credit Hours.**

This course is intended for students in the life sciences and environmental sciences who are interested in learning how to use and apply statistics. The course will cover basic concepts of probability and statistics, as well as a number of useful statistical methodologies that are used in biology and environmental science, such as regression, analysis of variance, and univariate non-parametric statistics. The course will include homework assignments, which the students will conduct using both Excel and the free statistics package R (<http://cran.r-project.org/>), so that they will get hands-on experience with the methodology.

**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 615. Marine Tourism and Conservation. 3 Credit Hours.**

This course introduces students to critical concepts in the practice and management of marine tourism, and explores the potential of tourism to contribute to marine conservation across different geographical locations and taxa. Discussion, readings, and lectures encourage students to draw connections between the biology and ecology of organisms and ecosystems and existing human-environment relationships. We also consider the social context in which tourism is occurring, and how this may shape the success or failure of tourism operators in contributing to conservation. This course will also explore questions about “consumptive” and “non-consumptive” uses of marine resources. Discussion will evaluate both the potential and the limitations of marine tourism as a tool for environmental protection.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**RSM 616. Florida Topics in Environmental Law & Policy. 3 Credit Hours.**

This course will provide an overview of environmental policy at the state and local level in Florida. The course will include an analysis of relevant law, policy, and emerging issues for Florida-specific environments, focusing on environmental themes that are of particular importance to marine professionals, such as: Everglades restoration, coral reef protection, fish and wildlife management, watershed and land management, invasive and listed species, waste management, energy, and climate change policies.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**RSM 617. Instrument Design and Quick Prototyping for Marine Science. 2 Credit Hours.**

Introduction to the principles and applications 3D printing, scanning and digital manufacturing for non-engineers. It will cover the basic principles and practice of: (1) computer aided design and drafting (CAD); (2) digital manufacturing techniques, including 3D printing and CNC machining (milling and laser cutting); and (3) performance assessment of student-manufactured prototypes. This will be achieved through lectures and hands-on training in the RSMAS Makers Lab, whereby each student will be required to design, construct, and field-test a new piece of hardware that is relevant to their field and/or individual research.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Summer.

**RSM 618. Setting a Course for Success: Professional Development for STEM Students. 1 Credit Hour.**

The scientific job market has always been a highly competitive space, and it seems to get more so every year. This course is intended to help students explore their aptitude, focus their intentions, and set goals to achieve success in the academic, government, or industrial job market. Through identifying core motivations, matching intentions with career paths, and collaborative exercises, students will construct the application materials needed for upcoming internship and job applications as well as practice interview skills.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & 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 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 630. Elasmobranch Field Research Skills. 3 Credit Hours.**

This field course introduces students to essential principles of responsible fieldwork with elasmobranchs (sharks and rays). Through a combination of readings, structured discussions of primary literature, guest lectures, opportunities to learn about and contribute to gear construction, practice with the administrative requirements for working with animals, including IACUC and state and federal permitting processes, and hands-on experience with elasmobranchs, students will leave with a strong understanding of the technical, administrative, and practical aspects of best practices for conducting field research with sharks and rays.

**Components:** FLD.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**RSM 631. Teleost Field Research Skills. 1 Credit Hour.**

This short course introduces students to essential skills and knowledge for performing fieldwork with teleost fish. This intensive workshop includes an introduction to fish of South Florida, especially targeting essential characteristics for identification, and provides base knowledge about fish morphology, anatomy, habitat, and life history. After a half-day of classroom lectures and activities, students will spend two weekend days in the field learning techniques to sample for and identify a variety of teleost fishes. This course is not recommended for students taking MBE 621.

**Components:** FLD.

**Grading:** GRD.

**Typically Offered:** Spring.

**RSM 632. Research Vessel Operations. 1 Credit Hour.**

This short course introduces students to essential skills for serving as crew or research staff aboard medium-sized research vessels. The intensive workshop includes on-vessel experience with research vessel operations of US Coast Guard certificated vessels. Over two and a half days, students will build experience with essentials of acting as crew on research vessels, including vessel operations, docking, chart-reading, anchoring and mooring, responding to on-board emergencies, and vessel logistics and research cruise planning.

**Components:** FLD.

**Grading:** GRD.

**Typically Offered:** Spring.

**RSM 633. Survey of Telemetry for Animal Movement Research. 1 Credit Hour.**

This two-day workshop is designed to give students an introduction to the breadth of technologies available for telemetry studies. Tracking animals for the purpose of addressing questions regarding movement and behavior has been an increasingly employed research methodology over the past three decades. Technological advances have rapidly transformed our ability to collect more data over longer periods of time, and the use of telemetry techniques has become ubiquitous across many taxa and disciplines.

**Components:** FLD.

**Grading:** GRD.

**Typically Offered:** Spring.

**RSM 640. DEIA in Marine Science Broader Impacts: Theory & Reflection. 1 Credit Hour.**

This unique course will focus on various concepts related to the theory of equity, diversity, inclusion, and accessibility, as well as practical examples and helpful strategies to ensure DEIA in broader impacts and everyday lives. We will emphasize meaningful conversations about DEIA and strategies to both address inequities as individuals and educators and ensure effective science communication and inclusion.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**RSM 641. Broadening Participation in Marine Science. 3 Credit Hours.**

This unique course will focus on various concepts related to broadening participation of underrepresented minorities in marine science and conservation. During the course, students will learn how to effectively implement the fundamental principles, goals, and practice of integrative informal STEM education and broader impacts by developing, coordinating, and hosting an outreach event for K-12 students in under-served schools.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**RSM 645. Science Communication: Professional Writing. 1 Credit Hour.**

This course introduces students interested in scientific research to various techniques for processing and presenting research data and information. Students will learn techniques to effectively present research to the general public and to the scientific community in written form, such as research papers, grant proposals, conference presentations and fact pages.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**RSM 646. Presentation Boot Camp. 1 Credit Hour.**

This course focuses on presenting scientific concepts and research findings more effectively to both technical audiences and the general public.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**RSM 647. Methods for Marine and Atmospheric Education. 3 Credit Hours.**

This course focuses on curriculum and instructional methods for teaching marine and atmospheric content in formal and informal settings. The course will introduce students to recent national science and engineering, climate, and ocean education standards and best curricula and instructional approaches for teaching and learning science. The course will also focus on identifying and analyzing research on marine and atmospheric education and effectively communicating scientific topics to different audiences.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**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 649. Advanced Presentation Boot Camp. 1 Credit Hour.**

This follow-up course builds upon the topics and approaches covered in the basic training session and focuses on advanced techniques for designing and delivering effective scientific presentations to both technical audiences and the general public. The course provides opportunities for students to expand and practice their critique language and hone their presentation evaluation and design skills.

**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:** Offered by Announcement Only.

**RSM 664. Scientific Small Boating. 2 Credit Hours.**

The scientific small boating course provides entry-level training for persons interested in becoming small boat operators or crewmembers for marine science research and/or fieldwork purposes. The course is designed to give students broad academic knowledge and practical training in the safe operation of vessels 36 feet length overall. Course content focuses heavily on navigation, rules of the road, local area knowledge, legal requirements, and emergency procedures. In addition to meeting US Department of the Interior MOCC certification requirements (see RSM 667 course description), students are taught project-specific techniques and technical skill-sets that scientific small boat operators must be proficient in. Students must possess a valid US or international driver's license with a clean driving record (no at-fault accidents within the last three years and no more than 3 points on Motor Vehicle Record), and complete a boating physical exam to be eligible for this course.

**Components:** FLD.

**Grading:** SUS.

**Typically Offered:** Fall & Spring.

**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:** Offered by Announcement Only.

**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 Certification Course. 1 Credit Hour.**

The MOCC course is intended to give students basic academic knowledge and training in operating Class A and Class I vessels (<26 feet length overall). In addition to learning relevant theory, students gain hands-on experience in slow and high speed maneuvering, trailering, launching and loading at boat ramps, marlinspike (knot tying), and in-water emergency procedures, including the use of flares and pyrotechnics. Federal agencies such as the US Department of the Interior and the US Fish & Wildlife Service require MOCC certification. This course meets minimum small boat training standards recognized by many other government, non-profit, and private research organizations as well. Students must possess a valid US or international driver's license with a clean driving record (no at-fault accidents within the last three years and no more than 3 points on Motor Vehicle Record), and complete a boating physical exam to be eligible for this course.

**Components:** FLD.

**Grading:** SUS.

**Typically Offered:** Fall & Spring.

**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:** 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 700. Research Ethics. 0 Credit Hours.**

Online research ethics training, required for all graduate students.

**Components:** DIL.

**Grading:** SUS.

**Typically Offered:** Fall & Spring.

**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:** Offered by Announcement Only.

**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 780. Directed Readings. 1 Credit Hour.**

The goal of this directed readings course is to cover a wide range of current marine and atmospheric science topics, and to give students experience independently reading about recent advances in research. The course will also give the students an opportunity to practice presentation and communication skills. Students will be assessed based on their presentations and participation.

**Components:** DIS.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.