

MARINE BIOLOGY (MARB)

MARB 5392 Thesis Proposal

3 Semester Credit Hours

Thesis students must submit a completed proposal for their thesis project. A course section will be created for the student to enroll. Upon successful completion and submission of the proposal signed by the graduate committee of the student, students may then register for MARB 5393 - Thesis Research. If course is not completed by end of the semester, a grade of "IP" will be awarded. An "IP" is a permanent, non-punitive, grade notation. In order to receive a qualitative grade the student must enroll in this course in a subsequent semester.

MARB 5393 Thesis Research

3 Semester Credit Hours

Implementation of the Thesis Proposal, and the production of a rough draft of the thesis submitted to the graduate committee of the student for initial editing and comment. A course section will be created for the student to enroll. If course is not completed by end of the semester, a grade of "IP" will be awarded. An "IP" is a permanent, non-punitive, grade notation. In order to receive a qualitative grade the student must enroll in this course in a subsequent semester.

Prerequisite: MARB 5392.

MARB 5394 Thesis Submission

3 Semester Credit Hours

Completion of the final draft of the thesis, signed by the graduate committee of the student and ready for binding and distribution. A course section will be created for the student to enroll. If course is not completed by end of the semester, a grade of "IP" will be awarded. An "IP" is a permanent, non-punitive, grade notation. In order to receive a qualitative grade the student must enroll in this course in a subsequent semester.

Prerequisite: (MARB 5392 and 5393)*.

* May be taken concurrently.

MARB 5940 Master's Project Research

1-9 Semester Credit Hours

Research related to the M.S. project. Open only to M.S. students in marine biology with consent of the graduate advisor. Does not count as credit toward regular graded (non-research, non-variable credit) coursework for M.S. degree requirement in marine biology.

MARB 6301 Coral Reef Conservation Issues

3 Semester Credit Hours (3 Lecture Hours)

Survey of challenges and threats facing coral reef ecosystems in the 21st century and discussion of conservation and management strategies. Topics include biology and ecology of reef ecosystems, climate change impacts, coral bleaching, over-fishing and the effectiveness and design of marine protected areas.

MARB 6310 Physiological Adaptations in Animals

3 Semester Credit Hours (3 Lecture Hours)

A study of the physiological adaptations of animals to their environment, including osmoregulatory and temperature regulatory mechanisms.

Prerequisite: BIOL 3430.

MARB 6312 Communicating Science Seminar

3 Semester Credit Hours (3 Lecture Hours)

Covers communication topics ranging from proposal writing to professional presentations with a minor emphasis on additional non-traditional communication formats. Must be taken to fulfill degree plan requirements by all Marine Biology graduate students and is recommended in the first spring of the degree.

MARB 6314 Aquatic Animal Nutrition

3 Semester Credit Hours (3 Lecture Hours)

The study of current concepts in aquatic animal nutrition including nutrient sources and requirements, deficiency effects, ingestive/digestive/metabolic processes, formulation and processing of feeds, and practical feeding considerations for selected aquatic species.

MARB 6327 Marine Restoration Ecology

3 Semester Credit Hours (3 Lecture Hours)

Overview of the rapidly expanding practice of restoring degraded marine, estuarine, and coastal ecosystems. Teaching methods will include lectures, discussion, paper critiques, field visits, and restoration plans. Course will explore ecological theory as it applies to restoration, restoration planning and implementation strategies, and controversies surrounding the practice of restoration.

MARB 6333 Marine Benthic Ecology

3 Semester Credit Hours (3 Lecture Hours)

The ecology of benthic assemblages with emphasis on species and habitats below diver depths. Micro to mesoscale spatial patterns, including bathymetric distribution, abundance and size-structure, diversity gradients, energetics and feeding strategies, and zoogeography of the benthos will be covered. Hydrothermal vents, cold seeps and sea mount fauna will receive special attention.

MARB 6335 Aquatic Microbiology

3 Semester Credit Hours (3 Lecture Hours)

Types and distribution of microorganisms in aquatic environments. Interactions with other organisms. Role in nutrient cycling, degradation of organic substances, pollution, water purification.

Prerequisite: BIOL 2420.

MARB 6340 Marine Organisms and Processes

3 Semester Credit Hours (3 Lecture Hours)

This course will introduce students to the biology of major plant and animal groups in the ocean. Students will also learn about important physical and chemical features of the oceans, and how these interact with marine life to regulate marine ecosystem function.

MARB 6341 Evolution and Genomics of Marine Organisms

3 Semester Credit Hours (3 Lecture Hours)

This course will introduce students to the evolutionary history of life in the ocean. Students will also learn about modern evolutionary theory, processes of speciation and processes which create diversity and adaptive capacity within species. Finally, the course will touch on functional genetics and the use of modern molecular techniques to understand organismal evolution and function.

MARB 6342 Genomics, Proteomics and Bioinformatics

3 Semester Credit Hours (3 Lecture Hours)

An introduction to integrative biological study using genome-wide approaches and bioinformatics. The "-omics" technologies (Genomics, Proteomics, Metabolomics, etc.) will be surveyed for current and potential contributions to understanding biological function at molecular, cellular, organismal and ecosystem levels. Offered in Fall semester of odd-years only. Cross listed with BIOL 5340.

MARB 6343 Oceans and Human Health**3 Semester Credit Hours (3 Lecture Hours)**

Oceans are increasingly recognized for their role in the health of the human population, both as a source of waterborne disease and a source of new bioactive (medicinal) agents. Indeed, healthy oceans are essential to the habitability of our planet – for humans and all other forms of life. Students will explore links between oceans, pollution, human well-being, ecosystem services, resource management, and the science and legislation governing the enforcement of water quality standards. This multidisciplinary subject will be addressed using a combination of lecture and discussion of primary literature. Offered in Fall semester of even-years only.

MARB 6353 Down the River: Ecology of Gulf Coast Fishes**3 Semester Credit Hours (3 Lecture Hours)**

This course covers aspects of ecology and biogeography of riverine and estuarine fishes while exposing students to field sampling techniques and museum preparation of specimens. This will be a unique opportunity for students to gain an in-depth understanding of the biological complexity of Texas Gulf Coast river systems while gaining hands-on experience in field and museum ichthyological techniques that are employed by state, federal and academic researchers alike.

Co-requisite: SMTE 0091.

MARB 6360 Computation for 21st Century Biologists**3 Semester Credit Hours (3 Lecture Hours)**

This is a 3 credit course for graduate students that introduces the powerful open-source computing tools that are used in biological research for the creation, organization, manipulation, processing, analysis, and archiving of “big data”. This course is designed to prepare and enable students to use computational tools for bioinformatic applications in advanced courses and independent research projects. The primary topics covered are: data formats and repositories, command line Linux computing and scripting, regular expressions, super-computing, computer programming with PYTHON and R, data visualization with R, version control and dissemination of scripts and programs with GIT, typesetting with LATEX, and organizing data with SQL relational databases. While not a formal requirement, it is assumed that students have a firm command of basic algebra. Cross listed with BIOL 4360 and BIOL 5360

MARB 6362 Global Change and Its Impact on Aquatic Ecosystems**3 Semester Credit Hours (3 Lecture Hours)**

This course will introduce students to the effects of climatic and anthropogenic change on aquatic ecosystem structure and function. Includes readings from the current literature and development of a research proposal. Cross-listed with CMSS 6362.

MARB 6363 Geomicrobiology**3 Semester Credit Hours (3 Lecture Hours)**

An exploration of the interface between geological and biological processes focused on the mutual effects of microorganisms and Earth's chemistry. Topics include biomineralization, origin and evolution of life, microbial weathering and rock formation, and influences on environmental problems.

MARB 6371 Evolutionary Genetics**3 Semester Credit Hours (3 Lecture Hours)**

An advanced introduction to evolutionary processes and their genetic basis, focusing on theoretical and experimental approaches to the study of population genetics, phylogeography, coalescence theory, evolutionary ecology, and molecular evolution.

Prerequisite: BIOL 2416.

MARB 6373 Biodiversity and Conservation**3 Semester Credit Hours (3 Lecture Hours)**

Principles of, and threats to, the conservation of marine and terrestrial biological diversity. Topics include patterns and processes creating biological diversity, causes of diversity loss, the role of economics, policy, ethics, and institutions, ecosystem management, including marine protected areas, and the use of models in conservation planning and evaluation. Offered every Fall.

MARB 6392 Dissertation Proposal**3 Semester Credit Hours**

Ph.D. students must submit a completed proposal for their dissertation project. A course section will be created for the student to enroll. Upon successful completion and submission of the proposal signed by the graduate committee of the student, students may then register for MARB 6393 - Dissertation Research. If course is not completed by end of the semester, a grade of "IP" will be awarded. An "IP" is a permanent, non-punitive, grade notation. In order to receive a qualitative grade the student must enroll in this course in a subsequent semester.

MARB 6393 Dissertation Research**3 Semester Credit Hours**

Implementation of the Dissertation Proposal, and the production of a rough draft of the dissertation submitted to the graduate committee of the student for initial editing and comment. A course section will be created for the student to enroll. If course is not completed by end of the semester, a grade of "IP" will be awarded. An "IP" is a permanent, non-punitive, grade notation. In order to receive a qualitative grade the student must enroll in this course in a subsequent semester.

Prerequisite: MARB 6392.

MARB 6394 Dissertation Submission**3 Semester Credit Hours**

Completion of the final draft of the dissertation, signed by the graduate committee of the student and ready for binding and distribution. A course section will be created for the student to enroll. If course is not completed by end of the semester, a grade of "IP" will be awarded. An "IP" is a permanent, non-punitive, grade notation. In order to receive a qualitative grade the student must enroll in this course in a subsequent semester.

Prerequisite: MARB 6392 and (MARB 6393 or 6393*).

* May be taken concurrently.

MARB 6408 Microbial Ecology**4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

Relationships between microorganisms and their biotic and abiotic environments. Role of microorganisms in biogeochemical cycling. Methodology in microbial ecology. Biotechnological aspects.

Co-requisite: SMTE 0092.

MARB 6428 Fisheries Ecology**4 Semester Credit Hours (4 Lecture Hours)**

FISHERIES ECOLOGY Advanced study of theory and techniques in fisheries science including behavior of fisheries populations and applications to resource management with emphasis in tidal-influenced waters. Includes readings in the current literature and a research project. The laboratory will emphasize practical sampling design and data interpretation. SMTE 0091 is a co-requisite for this course. Documented completion of this safety training is required early in the semester for continued participation in this course.

MARB 6430 Marine Plankton**4 Semester Credit Hours (4 Lecture Hours)**

Investigation of the systematics, distribution and ecology of marine plankton. Cross listed with BIOL 5430.

Co-requisite: SMTE 0091.

MARB 6431 Phycology**4 Semester Credit Hours (4 Lecture Hours)**

Study of the major groups of freshwater and marine algae; morphology, ecology, systematics, life cycles and physiology. Laboratories emphasize collection, identification and culturing techniques.

Co-requisite: SMTE 0092.

MARB 6436 Marine Ecology**4 Semester Credit Hours (4 Lecture Hours)**

Advanced studies in structure and habitats of marine environments. Emphasis on factors influencing distribution of marine organisms, including field trips to areas along the Texas coast.

Prerequisite: BIOL 3428.

Co-requisite: SMTE 0091.

MARB 6452 Ecology and Evolution of Fishes**4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

This course covers aspects of fish ecology from individual, population, community, and ecosystem levels. We discuss the role of the environment on fish physiology and behavior, food-web dynamics, community assembly and diversity, ecosystem interactions, and anthropogenic impacts on fishes with a focus on conservation.

Co-requisite: SMTE 0091.

MARB 6590 Special Topics**5 Semester Credit Hours (5 Lecture Hours)**

An advanced study of a biological topic. May be repeated with full credit in another area of marine biology.

Prerequisite: SMTE 0091*, 0092* or 0093*.

* May be taken concurrently.

MARB 6596 Directed Independent Study**1-5 Semester Credit Hours (1-5 Lecture Hours)**

Study in areas of current interest. A total of six semester hours of Directed Independent Study may be counted towards the M.S. or Ph.D. degree.

MARB 6940 Dissertation Project Research**1-9 Semester Credit Hours**

Research related to the dissertation project. Open only to Ph.D. students in Marine Biology with consent of the graduate advisor. Does not count as credit toward regular graded (non-research, non-variable credit) coursework for Ph.D. degree requirement in Marine Biology.