

MARINE BIOLOGY, PHD

Program Description

The Marine Biology Program is designed for students with an interest in one or more of the subdisciplines of marine biology and who wish to pursue careers in higher education, government, or private industry. This degree program combines the strength of a diverse, internationally recognized faculty with high scholarly productivity and extramural funding. Additionally, Texas A&M University – Corpus Christi is located on the Gulf of Mexico, facilitating hands-on learning and research. Students can choose from a variety of classroom and field learning experiences and form committees with any participating faculty.

The Marine Biology program offers the Master of Science and the Doctor of Philosophy degrees in Marine Biology. A personalized graduate advisory committee guides each student through the conception, design, construction, and execution of a marine biology-based inquiry.

Student Learning Outcomes

As part of their progression through the Marine Biology Program, Doctor of Philosophy students will:

- Gain an in-depth of knowledge of essential and emerging concepts in the field of marine biology.
- Perform scholarly hypothesis-driven research grounded in marine biological principles and concepts.
- Prepare and defend a Dissertation proposal outlining planned research activities
- Successfully pass a Comprehensive Examination that assess breadth and mastery of knowledge of marine biology and topics relevant to the student's planned research
- Write and successfully defend a PhD Dissertation detailing original scholarly research performed during the degree and demonstrate mastery of relevant scientific literature.
- Demonstrate advanced communication skills through either presentation of research results at professional scientific meetings and/or through peer-reviewed publication.
- Develop a skill set and research record such that they can secure employment in academia, state/federal agencies, private companies, or non-governmental organizations.

For Additional Information

Website:

www.marinebiology.tamucc.edu (<http://www.marinebiology.tamucc.edu>)

Campus Address:

Tidal Hall, Room 309
Phone: (361) 825-2754

Mailing Address:

Marine Biology Program, Tidal Hall 309
Texas A&M University-Corpus Christi
6300 Ocean Drive
Corpus Christi, Texas 78412

Admission Requirements

Those seeking admission to the Marine Biology Program should apply through the Office of Recruitment and Admissions. In addition to the documents required by that office, applicants must submit an essay

of no more than 1,000 words describing their educational and career goals, and interests as they relate to the faculty in the Marine Biology Program; a list of names of faculty members contacted; three letters of recommendation from people familiar with their potential for graduate studies; transcripts of all previous undergraduate/ graduate work; Graduate Record Examination (GRE) scores that are not more than 5 years old; and a résumé. Additional requirements exist for international students, including TOEFL or IELTS scores from ETS taken within the last two years for students from countries where English is not the native language, and a course by course foreign transcript evaluation through an approved service (refer to the Admission section of this catalog). All relevant supplemental materials (such as publications or other documents that include information about relevant experiences) that are submitted with the application will be considered. Persons seeking admission to the Ph.D. Program in Marine Biology should first contact the program faculty and identify a faculty member will to serve as the graduate advisor. Applicants will not be admitted to the program without a graduate advisor.

Completed applications must be received by the CGS by the specified priority deadlines:

- Fall Semester - December 1
- Spring Semester - June 1

Incomplete applications are not considered. The applicant will be notified of acceptance or rejection by letter.

Teaching assistantships, graduate research assistantships, and fellowships may be available to admitted degree-seeking students who maintain full-time graduate student status (9 hours/fall and spring semester, and 3 hours/summer). The completed Teaching Assistant Application (<https://gradcollege.tamucc.edu/funding/index.html> (<https://gradcollege.tamucc.edu/funding/>)) and all other materials requested for evaluation should be submitted to the office indicated on that form. For full consideration, the deadline for submitting applications is December 1 for the following academic year. A limited number of fellowships are available, and faculty members conducting funded research projects often hire qualified graduate students as Research Assistants. Students will need to contact faculty members in their field of interest for information on these opportunities.

Academic Preparation

Students entering the Marine Biology Program are expected to have a strong background in biological and physical sciences, with competencies equivalent to those required of Texas A&M University-Corpus Christi undergraduate biology majors (see the biology section of the undergraduate catalog).

Program Requirements

Advising and the Graduate Advisory Committee

After being accepted into the MARB program and enrolling, the most important first step is forming the graduate advisory committee (GAC). ***Students should form a graduate advisory committee with the approval of their advisor by the end of their second long semester in the MARB program to help guide them through their degree program.*** Students are ***strongly encouraged*** to meet with their committee at a minimum of once per year to seek continual guidance on their research program.

Composition and size of the committee should reflect the scope of the intended graduate studies and should be developed with substantial input from the student's advisor(s). The advisor(s) will serve as chair(s)

of the committee. The majority of the committee members must be members of the Marine Biology Graduate Faculty. Recognized scholars who are not a member of the TAMU-CC graduate faculty may serve on a student's committee by submitting a letter of request from the advisor, through the TAMU-CC Marine Biology Program Coordinator, with the individual's resume attached as well as a completed "Form 2 (<http://gradschool.tamucc.edu/forms/Canales/Form2.doc>)" from CGS (Graduate Faculty Status Application). The scholar may serve upon approval of the TAMU-CC CGS. Only one CGS appointed scholar may be counted toward the minimum committee member composition. For Doctoral (Ph.D.) in Marine Biology degrees, the committee shall consist of no fewer than four members, three of which must belong to the MARB Graduate Faculty, including the advisor(s). The Chair (and/or Co-Chair) must be a member of the MARB Graduate Faculty.

Upon submitting a degree plan for Ph.D. students, CGS will appoint a Graduate Faculty Representative (GFR) to the committee. The role of this appointee is to serve as an impartial member of the committee to ensure the integrity of University standards as they apply to the Ph.D. process. The GFR attends both the dissertation proposal defense and the final defense/oral examination.

Enrollment Requirements

All students are required to maintain continuous registration until completion of all requirements for graduation unless a specific leave of absence is granted (in writing) by the department. Students funded through scholarships, fellowships and assistantships are required to maintain a minimum of 9 hours/fall and spring semester, and 3 hours/summer. To continue to maintain the proper number of hours after completing all formal coursework on the degree plan, a student may register for MARB 6940 Dissertation Project Research (1-9 sch).

Coursework and Research

Students must demonstrate to the GAC that the selection of classes or research projects produces a coherent course of study focused on the student's particular area of emphasis. Depending on the emphasis area, elective and specialized coursework selections may be chosen from biology, biomedical sciences, chemistry, coastal and marine system science, computer science, environmental science, geographic information science, geology, fisheries and mariculture, mathematics, or other course offerings as stipulated and approved by the GAC. Students accepted to the Marine Biology PhD program without an MS degree in an appropriate discipline are required to take more semester hours of credit than students accepted with such a degree.

1. Specialized and Elective Coursework

The program specifies the minimum number of semester credit hours (SCH) that must be earned from regular, graded (non-research, non-variable credit) coursework: for students with only a bachelor's degree, 41 of 96 total hours; and for PhD students with an appropriate master's degree, 19 of 64 total hours. Classes or research projects designated as part of the specialized coursework requirement must receive the approval of a student's GAC

2. Research Coursework

Three courses form the required research component of the degree for PhD students: MARB 6392 Dissertation Proposal (3 sch), MARB 6393 Dissertation Research (3 sch), MARB 6394 Dissertation Submission (3 sch). PhD students should take MARB 6940 Dissertation Project Research (1-9 sch) to fulfill the proper number of semester course hours; this course is graded satisfactory/unsatisfactory and may be repeated. Students must

enroll in MARB 6394 Dissertation Submission (3 sch) during their last semester when their dissertations will be completed.

PhD Students Admitted with Only a Bachelor's Degree

Students accepted to the Marine Biology PhD Program with only a bachelor's degree (i.e., without an MS degree in an appropriate discipline) must complete a minimum of 96 semester hours of coursework and research.

Code	Title	Hours
MARB 6312	Communicating Science Seminar	3
MARB 6340	Marine Organisms and Processes	3
MARB 6341	Evolution and Genomics of Marine Organisms	3
MARB 6392	Dissertation Proposal	3
MARB 6393	Dissertation Research	3
MARB 6394	Dissertation Submission	3
MARB 6940	Dissertation Project Research (taken to a total of 46 sem. hrs.)	46
Select one or both of the following:		3-6
CMSS 6303	Natural Systems Analysis	
CMSS 6323	Experimental Design	
Specialized, elective, and topical coursework		29
Total Hours		96-99

PhD Students Admitted with a Master's Degree

Students accepted to the Marine Biology PhD Program with an MS degree in an appropriate discipline must complete a minimum of 64 hours of coursework and research.

Code	Title	Hours
MARB 6312	Communicating Science Seminar	3
MARB 6340	Marine Organisms and Processes	3
MARB 6341	Evolution and Genomics of Marine Organisms	3
MARB 6392	Dissertation Proposal	3
MARB 6393	Dissertation Research	3
MARB 6394	Dissertation Submission	3
MARB 6940	Dissertation Project Research (taken to a total of 36 sem. hrs.)	36
Select one or both of the following:		3-6
CMSS 6303	Natural Systems Analysis	
CMSS 6323	Experimental Design	
Specialized, elective, and topical coursework		7
Total Hours		64-67

Doctoral Candidacy and the Comprehensive/Qualifying Examination

To be admitted to candidacy for the MARB Ph.D. degree a student must have a cumulative GPA and a degree plan GPA of at least 3.0, satisfy the residence requirement (completion of 9 credit hours in two consecutive long semesters), and pass the qualifying examination. Formal Comprehensive/Qualifying examinations (often referred to as "preliminary exams") for the Ph.D. may be given by the student's GAC if the student is within 6 hours of completing formal degree plan coursework (i.e., except MARB 6940 Dissertation Project Research (1-9 sch)) but **must** be given before the end of the semester following completion of regular coursework on the degree plan, no later than the end of the 4th (for students with M.S.) or 6th (for students with B.S.) long

semester in the program. An approved dissertation proposal must be on file prior to taking the qualifying exam. Students and/or committee chair should consult with the designated Academic Advisor in the College of Graduate Studies, to ensure that the proposal has been filed. *A student must be admitted to degree candidacy at least 1 year before the date of the final dissertation defense/oral examination.* CGS will not authorize a final dissertation defense/oral examination for any doctoral student who has not been admitted to candidacy.

Qualifying exams will cover all areas within the scope of the student's doctoral program, and will involve written exams from each GAC member, followed by an oral exam administered by the committee as a whole. Committee members may participate remotely if necessary, but **must** be present for the entire oral exam. Typically, a student will have (at most) a single day to complete the written questions from each committee member.

Each committee member will provide an evaluation of the student's performance on the written exam. In order to proceed to the oral exam, a student must pass the written exam, as determined by the committee. Individuals unable to pass the written examination(s) may be permitted to retake the exam when sufficient time has passed to allow students to address inadequacies emerging from the first examination.

Upon completion of the oral exam, the GAC members will then determine one final outcome ("Pass" or "Fail"). Two or more dissenting votes in the qualifying exam constitute "Fail". The graduate advisory committee chairman will report the results of the examination in a form to the CGS signed by all committee members. The form (Form "B") is available at: <http://gradschool.tamucc.edu/forms.html> under "Doctoral Program". A copy of the form should also be provided to the designated Academic Advisor in the College of Graduate Studies.

If the student successfully passes the qualifying examination, they will be advanced to candidacy. If a student fails the qualifying exams, the student may be dropped from the program OR the committee may recommend that the student complete a master's degree and be administratively withdrawn from the doctoral program. However, there is no guarantee of acceptance to master's program.

Format and Style of Dissertation

The dissertation must follow style requirements established in the Marine Biology Graduate Handbook and must be approved and signed by the members of the student's GAC, and the Dean of Graduate Studies. Guidance can be found in the Marine Biology Student Handbook (www.marinebiology.tamucc.edu (<http://www.marinebiology.tamucc.edu>)). For more information on formatting requirements, consult the College of Graduate Studies Doctoral Student information page (https://gradschool.tamucc.edu/current_students/doctoral_students.html).

Once the dissertation is completed and approved by the GAC, the results of the research must be presented orally and publicly. The final defense/oral examination usually takes place immediately following the seminar (see below). Graduate students are expected to present their research at a scientific meeting (other than their graduate seminar) prior to graduation.

Upon approval by a student's GAC, a copy of the dissertation will be sent to the Dean of Graduate Studies. At the time of successful completion of the final defense/oral examination, committee members will sign the dissertation and return it to the Dean of Graduate Studies for final

approval and signature. See also "Requirements for Doctoral Programs" in the general section of this catalog.

Final Oral Defense Examination

Each student must pass a final oral defense examination during the last semester before graduation. The student's GAC administers this examination which covers topics related to:

1. all graduate coursework undertaken for the Marine Biology program,
2. the student's specific research area, and
3. broad concepts of general and marine biology including familiarity with the literature and appropriate professional societies.

The student is responsible for scheduling the defense with the faculty involved. Doctoral students must enroll in the course MARB 6394 Dissertation Submission (3 sch) during the semester in which they are planning to defend their dissertation and/or graduate. A student who fails the defense may repeat it once, but only after an interval of four months or more, and will be required to re-enroll in MARB 6394 Dissertation Submission (3 sch). If a student fails the second defense, the student will be terminated from the program.

Courses

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.

Prerequisite: (BIOL 3428).

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.