



Savannah State University
College of Sciences and Technology
Department of Marine and Environmental Sciences



Graduate Student Handbook
Master of Science in Marine Sciences
2022-2023

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Cover: Graduates Jennifer Gut, Johnny Moore, [unknown non-SSU student], Catherine Carroll, Matthew Hunnewell, Brandon Coleman, with Ashton Arnold, BSMS alumni Terry Anderson and Kamilya Daniels with MSMS graduate Chelsea Parrish and Dontrece Smith.

How to Use This Handbook

This guide is the binding set of guidelines for matriculating as a master's student in the Department of Marine and Environmental Sciences. It describes the principles and practices of the thesis-driven process within the degree program. Use it as roadmap to your success from your initial application to your final convocation. The faculty and professional staff are all committed to your success and will assist you in any way they can.



The Marine Science Research Center on Livingston Ave.

I. Overview of the Program

a. Program History

The Master of Science in Marine Sciences (MSMS) Program is a graduate degree program located within the Department of Marine and Environmental Sciences (MES) and the College of Science and Technology (COST) at Savannah State University. The MSMS Program is housed in the Marine Biology building on campus and the new Marine Science Research Center on Livingston Ave., which opened in 2018. It is under the authority of the Office of Graduate Studies. The MSMS program was established in 2001 as a natural outgrowth of the highly-successful Bachelor of Science in Marine Biology degree program (1979-1996) that grew into the interdisciplinary Bachelor of Science in Marine Sciences Program (1996-present).

b. Program Philosophy and Structure

The program emphasizes one-on-one mentorship between the advisor and the student. The greatest strides in academic achievement are made within this relationship. Within this relationship are also the greatest challenges. Students are encouraged to establish clear, productive, communication with their advisors and their committee. If obstacles appear, students should contact the program coordinator to address them. If that is not successful, the program coordinator and/or the student will direct the matter to the department chairperson. Challenges that are not resolved at this level may be directed to the Dean of the College of Science and Technology, the University Graduate Studies Director, and Provost, in that successive order. A directory of these individuals is laid out below. The MSMS Program works diligently to build a sense of camaraderie among its faculty, staff, and students. The program personnel work very hard to provide for the professional needs of its students; it is a hallmark of our 19 year history.

c. Thesis-based Degree

The MSMS degree program is thesis-based, which means that all students are required to complete the curriculum requirements as well as complete an original research-based thesis document (see page 19) under the guidance of a thesis research advisor and advisory committee (see page 16) that must be defended publicly (see page 21).

d. Program Administrative Structure

All MES faculty may teach graduate-level courses. Department faculty are listed in Appendix B. Those faculty who have applied for and acquired graduate faculty status may serve on thesis committees and serve as thesis advisors. Adjunct or non-SSU faculty with affiliations with the graduate program may serve on thesis committees or as research advisors with the approval of the MSMS Program Coordinator. All policies in this handbook are supervised by the MSMS Program Coordinator with oversight by the Chair of the Department of Marine and

Environmental Sciences and the Director of Graduate Studies, in that order. Institutional supervision beyond that of the Office of Graduate Studies resides with the Provost and Vice President of Academic Affairs in the Office of Academic Affairs.

Administrative Structure and Contacts:



II. Program Milestones Checklist

Pre-admission

- Consider the type of research you would like to do and the career you would like to pursue. Contact the MES professor best aligned with your interests and set up a meeting to discuss projects and fit in their lab.
- Complete the graduate program application. Succinctly, but specifically include as much information about your interests, goals, and potential advisor and project as you can.
- Apply. **Deadline: March 20 (for fall) and Oct. 15 (for spring)**

What is next?

1. The Graduate Program will confirm that your application is complete.
2. The MSMS Admissions Committee will review applications AFTER it is complete.
3. The committee will make a recommendation to the MSMS program coordinator and MES Department chair. They will document their recommendations and send an admit, provisionally admit, or deny form to the Graduate Studies Office.
4. The Graduate Studies Office will send each applicant a letter that states their admission status.

Post-admission

- Meet with your advisor regularly to discuss your program and research.
- Have your advisor or the program coordinator advise you on coursework (repeat each semester until graduation).
- Send a copy of your registration bill to your funder if you have a fellowship.
- Get familiar with the program policies (<http://www.savannahstate.edu/cost/nat-science/marine-sci-policies.shtml>).
- Complete the [Liability Release form](#).
- Submit [Thesis Advisor Form](#) **Deadline: 1st Monday of November (Fall admissions) 1st Monday of April (Spring admissions)**
- If you are provisionally admitted, submit the [Provisional Status Academic Progress form](#) to the department chair by the **2nd Monday of December (Fall admitted students) or May (Spring admitted students)**.
- Select at least two other committee members. It is recommended that you meet with each to discuss your project and expectations. Two members of your committee must be MES faculty. This usually includes the thesis advisor. However, a research advisor may be selected from other approved institutions with approval from the MSMS program coordinator.
- Submit [Thesis Committee Form](#) **Deadline: 1st Monday of March (Fall admissions) 1st Monday of September (Spring admissions)**

Matriculation

- Have regular meetings with your advisor and periodic meetings with thesis committee for guidance.
- Write a thesis proposal.
- Pass thesis proposal defense with committee members in which you present thesis proposal and curriculum plan. Upon approval, submit the [Thesis Proposal Defense and Candidacy Qualification Form](#) to MES department chair. **Deadline: 1st Monday of May (Fall admissions) 1st Monday of December (Spring admissions)**
- Conduct research, do analysis, write thesis chapters and manuscripts.
- When you are close to completion, submit an [Application for Graduation](#) to the Registrar's Office. **Deadline: At least one semester prior to the graduation semester.** This includes a graduation fee due to the Cashier's office.
- Order fitted cap and gown at the college bookstore.
- Determine tentative thesis defense date. A thesis date reservation can be made with the program coordinator with advisor approval. A reservation does not indicate permission to defend.
- Have your advisor, and then your committee, review written drafts of your work until you have permission to defend. When you are approved to defend, submit the [Preliminary Thesis Approval and Permission to Defend Form](#)
- Penultimate draft of the thesis must be submitted to thesis committee members **Deadline: no later than three (3) weeks prior to the scheduled thesis defense date unless the committee unanimously agrees to a shorter period.** It should meet the guidelines of the most recent [SSU Graduate Thesis Guide](#), begin with the [Thesis Pages](#) as listed on the Marine Sciences webpage page, and the style defined by your advisor/committee
- Publicize the defense seminar using the [Thesis Defense Flyer](#).
- Defend your thesis with a public presentation and a closed committee meeting, **no later than 4 weeks prior to the date graduating students' grades are due in the registrar's office (see academic calendar)**
- Submit a signed [Thesis Defense Report Form](#) to the MES department chair and Director of Graduate Studies immediately after the defense.
- Upload the thesis document. Unless you request otherwise, your thesis will be published online only. This is the requirement for the program. Hard copies may be ordered using the Library Thesis Binding Request Form http://library.savannahstate.edu/forms/thesis_request_form.pdf
- Be awarded the degree by the President at graduation (usually the second Friday in May or December)

III. Beginning the program

a. Application Requirements

A complete application for admission to the graduate program in Marine Sciences consists of;

- Completed application form
- Statement of purpose (500-1000 words)
 - This statement should include why the applicant is pursuing the degree and identify preferred advisors and interests in specific thesis projects. It is expected that applicants communicate with prospective advisors about their research interests and fit within research labs prior to submitting an application.
- An official copy of all transcripts
- Official Graduate Record Exam (GRE) scores
- Two letters of recommendation (enclosed in sealed envelopes or submitted directly to the Office of Graduate Studies), and
- Certificate of Immunization (for students who plan to reside on campus).

b. Admissions

Regular Admission

Applicants may be granted regular admission provided they have met the following minimum degree program requirements:

- An undergraduate degree from an accredited college on file in the Office of Graduate Studies
- Coursework that is aligned with intended thesis and includes Calculus I (a pre-requisite for our core courses)
- Acceptable grade point average* (3.0 preferred, 2.5 minimum)
- Acceptable GRE scores* (combined Verbal + Quantitative >300 preferred; Writing > 3)

A student may be granted regular admission with deficiencies. Deficiencies must be addressed and resolved within the period specified in the acceptance letter.

A student may also be granted regular admission if they do not currently meet the above criteria, but will meet the criteria before the start of the program. Documentation of completion of those criteria (e.g., final transcripts, etc.) should be submitted to the MSMS program coordinator before the start of the program.

*The MSMS Admissions Committee evaluates all scores as part of the whole application package (GRE, GPA, letters of recommendation, essay) in admission decisions. While the preferred minimum scores are listed above, weaker scores in one area may be offset by stronger scoring in another area.

Provisional Admission

Applicants who do not meet the requirements for regular admission may be considered for provisional admission. Provisionally-admitted students are allowed to take up to a full-time course load in their first semester (usually 9-10 credit hours). The reason for provisional admission will be included in the admission letter and is at the discretion of the MSMS Admission Committee. Reasons for provisional status could include deficiencies in undergraduate coursework, not meeting the recommended GPA or GRE requirements, etc.

Requirements of Students with Provisional Status

It is expected that a student will only be on provisional status during their first semester (or after completing at least 9 credits, if part-time) so that a decision to either terminate the program or transition to regular status can be made as early as possible. However, if special circumstances prevent a student from completing the necessary requirements their first semester (e.g. needing a course that is not offered that semester), they may remain on provisional status for a second semester.

The following items are required of students admitted to the MSMS program with provisional status.

1. The student must have a graduate faculty member agree to be his/her major advisor or advocate *prior to admission*. If an advisor is not identified prior to admission, the M.S. program coordinator may serve as faculty advocate for the provisional student in his/her first semester and help in the identification of an appropriate advisor. The advisor is someone who shares the student's scholarly interests, provides assistance in refining thesis topics, and carries out other duties typical of a major advisor. It is the student's responsibility to seek out an advisor or advocate and contact them directly during the application and admission process.
2. Once admitted with provisional status, the student must immediately begin working with their advisor to develop an individualized mentoring plan to be submitted before beginning the program (1st day of classes). The purpose of the mentoring plan is to provide a roadmap to success for the duration of time until the student achieves regular status (typically by the second semester). The mentoring plan should identify what areas may need additional assistance, what resources will be used, methods of intervention in case of challenges, etc. The mentoring plan should include; expected course schedule, plan for advising/mentoring meetings, how will progress be made toward the thesis proposal, what interventions will be used if the student struggles in their courses, what interventions will be implemented if the student struggles to make progress on their thesis proposal. The student and advisor should discuss mid-term grades and thesis progress by mid-term and make any necessary adjustments. See section V. Mentoring plan for additional examples.

3. The student must obtain a B or better in each core course (listed by track on page 13) and maintain a B overall grade point average (≥ 3.0).
4. The student must successfully pass (receive a C or better) any undergraduate-level courses deemed necessary by the Admissions Committee prior to completion of his/her first semester in the MSMS program.
5. The student must submit a progress report to the MSMS Program Coordinator by the day after grades are due (final grades are usually submitted on the 2nd Tuesday of December for fall semester or the 2nd Tuesday in May in spring semester) to the Provisional Status Review Committee Chair.
6. The student must have his/her advisor submit a 1-page report on his/her thesis progress by the day after final grades are due to the Provisional Status Review Committee Chair.

Provisional Student Progress Reports and Committee Review

The full progress report consists of two parts: (1) The first part of the report is an academic progress report which documents progress in coursework. The academic progress report should be submitted to the Provisional Status Review Committee Chair and will then be reviewed by the Provisional Status Review Committee. The report should include titles of each class taken during the current semester and the final course grades. (2) The second part of the report is a letter (<2 pages) submitted to the Provisional Status Review Committee Chair by the student's advisor. This letter should focus on progress outside of the classroom, particularly regarding thesis work. Suggested issues to address include: Has a thesis topic been identified? Has a thesis committee been created? Has library research been initiated? Has an appropriate experiment and/or sampling scheme been designed? Have data been collected? Have analyses and/or statistics been completed? How many chapters will the thesis be and what are the titles? How much has been written? Have there been any major obstacles to their progress? If so, what is necessary in order to overcome them?

The Provisional Status Review Committee convenes and the student record is reviewed. After determining whether the student has met the requirements for provisional students stated above and addressed the deficiencies that resulted in provisional status as stated in their admission letter, the Provisional Status Review Committee submits its recommendation to either grant full admission or to remove the student from the program to the MSMS Program Coordinator, Department Chair, and Director of Graduate Studies. Notifications will be made before the start of the next term.

Provisional Status Review Committee

The Provisional Status Review Committee is comprised of three MSMS faculty members. Committee members serve for two years. If there is a conflict of interest (for example, if a committee member is the advisor or advocate of a provisional student under review), then it is that member's responsibility to find a substitute among the MSMS faculty. This substitute must either attend the appropriate portion of the meeting or submit a written evaluation and be available by telephone or video conference during the time of the meeting. The committee will provide a written assessment/recommendation to each provisional student. Committee findings have the authority to change the funding eligibility status of the student for financial assistance awarded by the department chair or faculty and can also be used to initiate academic termination of the student if significant thesis progress is not made.

c. Transferring prior coursework

Non-degree (Special) Admission

Non-degree seeking students can apply up to 8 semester hours of graduate credit taken at SSU to the MSMS program curriculum requirements if they are admitted to the program. Only 6 semester hours of approved graduate coursework not taken at SSU may be applied to the MSMS program curriculum requirements.

Transfer Credits

No more than six semester hours of graduate credit taken at another university or eight semester hours of graduate credit taken as a non-degree student at SSU may be applied toward the MSMS degree. Courses must have been passed with a B or better and must be approved by the students' thesis committee prior to the thesis proposal defense.

IV. Orientation

The Marine Science Master's Degree Coordinator or the faculty advisor will provide new students with a copy of the handbook (hard copy or electronic form) no later than the first day of classes of the first semester of enrollment in the program. This handbook includes all of the policies, procedures, forms, and information necessary to complete the degree. Students who have not received the information by this time may request it from the program coordinator. Students are governed by the course requirements in the version of the handbook published at the time of the admission as well as the SSU graduate catalog. Changes to policies in the handbook are applicable to all students at the time they are published. Electronic forms are on the program website.

V. Mentoring plan

The purpose of a mentoring plan is to assist students and advisors with a roadmap to success by laying out expectations, a plan for coursework and thesis development, and identify potential barriers before they become a roadblock to progress. While it is recommended that all students develop an individualized mentoring plan tailored to their specific needs with their advisor, it is only a requirement for provisional students and must be submitted to the program coordinator before beginning the program. Below are suggested sections to include in the mentoring plan as well as recommended details.

Example sections and content to include in mentoring plan:

Expectations for students – It is the student's responsibility take charge of the progress of their program. This means that they are responsible for maintaining frequent contact with their advisor, keeping them updated on their course progress, and being open about what areas they are struggling in so that appropriate resources can be implemented. Students are responsible for knowing the upcoming deadlines as outlined in this handbook, for scheduling meetings with committee, and maintaining their progress in their program.

Expectations for advisors – Advisors are expected to be available for regular meetings with the student to provide guidance, receive regular updates on the progress of courses and thesis development, and suggest adjustments to the plan as needed. Advisors should be familiar with the student's capabilities in skills necessary to be successful in the program (e.g. ability to use D2L for courses, ability to find resources, primary literature search and usage, basic quantification methods and graphing data, scientific writing, etc.) and identify additional resources to assist in areas that the student may struggle with. Advisors should be familiar with and provide assistance to the student navigating university services (e.g. financial, payroll and HR, health services, etc.)

Proposed program – Identify which track the student will complete, proposed duration to completion, plan for funding, etc.

List of courses – A list of courses registered for in the upcoming semester

Monitoring progress – Identify what methods will be used to monitor progress through the 1st semester (e.g. mid-term grades, etc.)

Resources – Identify what resources will be used if the student is in need of additional help. Examples could include assistance from the instructor, advisor, class peers, lab mates, etc.

Proposed thesis details - Include details such as who is the advisor, and what is the proposed thesis topic. It is ok if the topic still changes, but by this point, there should at least be a proposed topic briefly described and a general approach to the research.

Thesis proposal development plan – Include details such as plans for regular meetings between student and advisor, primary literature review, proof-of-concept preliminary sampling, etc.

VI. Financial Assistance

Applicants and students may apply for financial assistance in the form of research fellowships, teaching assistantships, research awards, and travel awards. Rules pertaining to financial assistance are stated below.

State Funds

Monies that originate from the State of Georgia and are disbursed through a degree granting college, school, department, or program are termed state funds. These funds typically are allocated by or requested from a department head, dean, or another administrative official. Included in these types of funds are teaching assistantships, laboratory coordinator positions, departmental research assistantships, or student employment (not awarded as need-based financial aid through the financial aid office).

Teaching Assistant sample duties:

- 1) To prepare and deliver laboratory instruction and assist with lecture instruction.
- 2) To prepare/administer/grade/record and return assignments, quizzes or examinations to students in a timely manner under the supervision of the professor of record.
- 3) To be available during office hours, via email or phone to students.
- 4) Report student misconduct to appropriate campus officials.

Independent Investigator Research Grant (HRG or “independent”) funds

These are funds that have been awarded to a single investigator or multiple investigators by an outside agency (federal, state, foundation, or private) to conduct research on a particular topic. These funds are directed toward the specific research goals of an individual or team and are governed by said individuals. They are mostly in the form of narrowly focused research assistantships associated with one of the principal investigators. Specific duties and expectations of research assistants are at the discretion of the principal investigator.

Research Program, Center or Institute (RPCI or “center” funds)

These are federal, private or foundation funds that have been awarded to an institution or investigators to establish an externally-funded center, program, or institute with a research and or educational mission. Such programs include those that award multiple internships/assistantships to students, seed money, or mini-grants to faculty. These funds are typically governed by a program director, coordinator, or manager and are most often research assistantships or student employment that may be awarded to students working with faculty affiliated with the program, center or institute.

Funding Guidelines:

- 1) Students requesting state or “center” funds must meet the minimum requirements for regular admission into the program. All students are

- eligible to receive “independent” funds at the discretion on the Principal Investigator of the award.
- 2) Assistantships and coordinator positions are funded as 20-hour per week commitments and combined with fulltime enrollment are considered fulltime positions. As such, these positions may not be combined with off-campus employment (of any kind) or other 20-hour positions (even on campus).
 - 3) Student loans and need-based financial aid are not evaluated when a student is considered for support.
 - 4) Assistantships may be suspended or revoked if a student is not making satisfactory progress towards the research project, teaching assignment, or in the degree program.
 - 5) Students are bound by all federal financial aid regulations and payroll guidelines of Savannah State University.

VII. Program of Study and Degree Requirements

a. Degree Tracks and the Core Curriculum

All students are required to take the fifteen-hour required core curriculum as listed below. This core provides a strong, multi-disciplinary investigation of marine science. Through seminar, content/knowledge courses, technical writing, and data analysis courses, students will investigate marine issues and develop professional skills in critical thinking, logical interpretations, and professional-quality presentations. With this common core background, the program of study provides three major tracks. Each track, chosen by the student in consultation with their advisor and committee, has specific curriculum requirements as well as options for courses within three curricular areas: a) Policy and Law, b) Research Tools and c) Science.

Track 1: Traditional Marine Science Research

The Traditional Marine Science Research track is designed for students: a) who plan to obtain an M.S. degree in Marine Sciences and continue on to a Ph.D. program or b) who wish to obtain a traditional research-based MS degree. Curriculum emphasis in this track is on science and original research.

Track 2: Applied Marine Sciences

The Applied Marine Sciences track is designed for students who wish to obtain an M.S. degree in Marine Sciences that provides them with the opportunity to learn and develop scientific skills applicable to marine science related industries, resource management, fisheries, aquaculture, and research. Curriculum emphasis in this track is on the acquisition of research tools and applied skills.

Track 3: Professional Advancement

The Professional Advancement track is designed for students who are presently employed in a related field and wish to earn an M.S. degree in Marine Sciences for possible professional development and advancement. Examples of these students are presently employed science teachers, federal, state and local government agency personnel, and persons currently working in industry and the private sector. The curriculum in this track requires the student to take courses from all three curricular areas and allows additional flexibility for additional courses, which are most applicable to his/her particular professional development needs.

Each track requires 30 semester hours of graduate-level coursework in addition to 6 credit hours of thesis research and preparation. An entering student must have passed an undergraduate-level calculus courses with a grade of 'C' or better or must take such a course, which would not count toward the graduate course requirements. An advisor and an advisory committee will guide each student in selection of elective coursework.

b. MSMS Program Course Requirements

Required core courses for all tracks:

MSCI 5201 General Oceanography (4)
MSCI 5202 Introduction to Coastal Oceanography (4)
MSCI 5401 Technical Writing and Communication (3)
MSCI 5402 Research/Marine Science Seminar (1)
MSCI 5560 Advanced Environmetrics (3)

Total core courses 15 credits

Required thesis courses for all tracks:

MSCI 7991 Thesis I (3 credits)
MSCI 7992 Thesis II (3 credits minimum, may be repeated)

Total thesis courses 6 credits

Track requirements:

Track I – Traditional Research

At least one course from “Policy and Law” (3)
At least one course from “Research Tools” (3)
At least two courses from “Science” (6)
One additional elective in consultation with advisor (3)

Track II – Applied Science

At least one course from “Policy and Law” (3)
At least two courses from “Research Tools” (6)
At least one course from “Science” (3)
One additional elective in consultation with advisor (3)

Track III – Professional Advancement

At least one course from “Policy and Law” (3)
At least one course from “Research Tools” (3)
At least one course from “Science” (3)
Three additional courses in consultation with advisor (6)

Total track requirements 15 credits

Total credits for degree program 36

Non-core Courses

Non-core courses are required to balance the student's training in the broader marine and oceanic sciences, as well as in policy, management, and technical areas. Each course is categorized by the curricular area it satisfies as listed below.

Policy and Law

- MSCI 6310 Scientific Ethics (3-0-3)
- MSCI 6323 Coastal Law and Policy (3-0-3)
- MSCI 6324 Coastal Zone Management (3-0-3)
- MSCI 7344 Fisheries Management (3-0-3)

Research Tools

- MSCI 5560 Advanced Environmetrics (3-0-3)
- MSCI 6542 Fisheries Population Dynamics (3-0-3)
- MSCI 6546 Mariculture (2-0-2)
- MSCI 6550 Analytical Techniques in Seawater, Sediments and Soils (0-3-3)
- MSCI 6552 Marine Biotechnology (3-1-4)
- MSCI 6560 Oceanographic Data Methods (3-0-3)
- MSCI 6562 Remote Sensing (3-0-3)
- MSCI 6572 Advanced Instrumentation (3-0-3)
- MSCI 7527 Coastal Environmental Certifications (3-0-3)
- MSCI 7564 Geographic Information Systems and Database Management in Coastal Studies (3-1-4)

Science

- MSCI 5501 Fish Ecology (3-0-3)
- MSCI 6202 Advanced Oceanography (3-0-3)
- MSCI 6550 Analytical Techniques in Seawater, Sediments and Soils (0-3-3)
- MSCI 6552 Marine Biotechnology (3-1-4)
- MSCI 6562 Remote Sensing (3-0-3)
- MSCI 6725 Coastal Wetland Ecology (3-0-3)
- MSCI 6726 Coastal Botany (3-1-4)
- MSCI 6745 Aquatic Pathology (3-1-4)
- MSCI 6747 Marine Mammalogy (3-0-3)
- MSCI 6781 Benthic Ecology (3-0-3)
- MSCI 7527 Coastal Environmental Certifications (3-0-3)
- MSCI 7562 Advanced Seminar in Remote Sensing (2-1-3)
- MSCI 7660 Oceanic Change (3-0-3)
- MSCI 7728 Coastal Processes (3-0-3)
- MSCI 7743 Fisheries Oceanography (3-0-3)
- MSCI 7754 Marine Biogeochemistry (3-0-3)
- MSCI 7782 Marine Microbial Ecology (3-0-3)
- MSCI 7783 Water Column Ecology (3-0-3)

Other Courses

- MSCI 7801 Directed Research (0-(1-3)-(1-3))
- MSCI 7851 Special Topics ((1-3)-0-(1-3))

c. Grade Requirements and Qualifying Examinations

Core Course requirements

All students in the MSMS Program are expected to complete the five core courses (listed below) with a grade of B or better.

MSMS Core Courses:

MSCI 5201 General Oceanography (3-1-4)

MSCI 5202 Introduction to Coastal Oceanography (3-1-4)

MSCI 5401 Technical Writing and Communication (3-0-3)

MSCI 5402 Research/Marine Science Seminar (1-0-1)

MSCI 5560 Advanced Environmetrics (3-0-3)

Non-core course requirements

With the exception of core courses and students who have provisional status, the number of Cs a student earns during their course is irrelevant as long as a cumulative 3.0 GPA is maintained.

Scholastic Warning/Academic Probation

A regularly admitted graduate student whose GPA falls below 3.0 (on a 4.0 scale) will receive a letter of scholastic warning from the University placing the student on Academic Probation.

Academic Termination

The following are grounds for Academic Termination from the program:

- A provisionally-admitted student who fails to achieve a 3.0 GPA after nine semester hours of coursework.
- The Provisional Status Review Committee finds that a provisionally-admitted student fails to make adequate progress toward the degree program requirements.
- A regularly-admitted student who is on academic probation and fails to achieve a 3.0 GPA after nine additional semester hours of coursework.
- A provisionally or regularly admitted who student fails to obtain a faculty advisor or form a thesis committee by their expected times (See section VII. Graduate Student Advisement and Thesis Committees).

Qualifying Examinations

Students who have successfully completed their core coursework are considered qualified to continue matriculating in the M.S. program and ready to pursue their thesis work. Therefore, students who receive grades of B or better in the core courses need not take a qualifying exam. Such students should, however, be prepared to answer integrative questions on concepts presented in the core courses at their thesis defense in addition to questions specific to their thesis research.

If a student fails to achieve a grade of B or higher in one of the MSMS core courses, he/she must immediately notify their thesis advisor and the MSMS Program Coordinator. Students only qualify for a test-out option if they receive a final C grade. Final Grades of D or F in one of the core courses do not qualify for testing out. If a student receives a D or F he/she must retake the core course. Where a C grade is present, the student must decide whether they will test out or retake course within 30 days after receiving a deficient grade. The qualifying exam must be taken during the following semester.

The qualifying exam should be scheduled no earlier than one month after the receipt of the unsatisfactory grade (C) to ensure ample preparation time. Based on the schedule of the administering faculty member, the qualifying exam should also be offered well in advance of the start of the semester in which the relevant course(s) will be taught next. The student should work cooperatively with the instructor to schedule the exam and notify the MSMS program coordinator of the agreed date. The exam will be designed and graded by the professor(s) who taught the core course (or the relevant section in the core course) in which unsatisfactory progress was made, and will be designed to test competency in that core area. It is the responsibility of the student to seek guidance on preparing for the exam from the relevant faculty member(s).

The qualifying exam will be in a written format with approximately one-half day allotted per exam. It will be initially evaluated by the course instructor. If it falls into a potentially failing category based on the instructor's evaluation, it will be evaluated by no less than three faculty members including the instructor for the course, the thesis advisor, and the MSMS program coordinator. For cases in which there is overlap (e.g. thesis advisor is coordinator), another faculty member will be selected to serve as a reviewer.

The student will have only one opportunity to pass the written qualifying exam. Students who pass the qualifying exam need not retake the course. The goal of the written qualifying exam in the core area is to allow continued matriculation, not replace grades. Current policy does not allow a grade to be changed after testing out. When a student receives deficient C grade but has met graduation requirements AND has passed the qualifying exam, an official letter will be included in the student's graduation packet indicating that student has met all graduation requirements even though he/she received a C grade.

If the written exam is not successfully passed, then the student will be required to reenroll in the course and achieve a B or better. Such a student reenrolls at their own expense. Scholarship or fellowship funds may not be used for repeating a course. Students who do not pass the course the second time with a 'B' or 'A' will be recommended for academic termination from the degree program.

VIII. Graduate Student Advisement and Thesis Committees

Students must have a thesis advisor named and submitted on the Thesis Advisor form by the first Monday in November (for fall students) or the first Monday in April (for spring students). The thesis advisor must be an approved graduate faculty member at SSU in the Marine and Environmental Sciences department.

In the case that a student ceases to have an advisor after the end of the first semester, that student will be placed on provisional status (following all deadlines and processes for provisional students) until a permanent advisor is identified. The program coordinator will serve as the student's program advocate until the advisor is confirmed. If a student fails to retain an advisor within 60 days of being without an advisor, they will be recommended to the Office of Graduate Studies office for academic termination.

An advisory thesis committee consists of at least three members, of which at least two are graduate faculty members based at Savannah State University. Thesis committees may have one member who is not based at Savannah State University. A Thesis Committee Form indicating the committee members must be submitted to the MSMS program coordinator by the 1st Monday of March (for fall students) or the 1st Monday of September (for spring students).

IX. Thesis Proposal

a. Thesis Proposal and Defense

A thesis proposal must be developed, presented to, and approved by the thesis committee in the form of a formal written document and an oral defense. The proposal must be defended by the end of the 2nd semester of study (i.e. 1st Monday of May for fall students and 1st Monday in December for spring students) for full-time students. The timeline for part-time students is at the discretion of the advisor and committee.

The proposal document should clearly describe the problem or questions to be addressed by the research with clearly stated hypotheses (or a problem statement), a preliminary literature review, the methodology to be used, and a timeline for project completion. A statement of needed equipment, supplies, and travel required for the project and how these items will be funded should also be included. The length of the document and its contents are agreed upon by the student and the advisor, however, the advisor has final approval of what the minimum requirements are. The proposal is the first document to describe the research approach, not the final thesis. This document is not meant to restrict the student from pursuing different avenues as opportunities arise within their

research, but to provide a clear initial guideline for the committee's input and approval.

Traditionally, the oral portion of the thesis proposal defense tests the student's knowledge of the background needed to pursue the proposed research, the methodology that will be used, and any content from the student's coursework that is relevant to the proposed project. Students are encouraged to meet with committee members to ask their expectations if the student is not sure of the content that will be covered. Advisors and committees have discretion over the requirements for the oral presentation (e.g. format, length, content). A short presentation by the student may be requested by the committee (but is not required), and the format for how questioning from the committee will be determined by the advisor and committee.

Students must pass the thesis proposal defense to continue matriculating in the MSMS program. If a student passes the proposal defense provisionally, the provisions must be satisfied under a timeline set by the committee (but not exceeding 60 days) in order for the student to proceed in the degree program. If a student fails the thesis proposal defense, the major advisor, supported by the majority opinion of the committee, may recommend termination from the degree program or reexamination to the program coordinator. The program coordinator may review the circumstances and make a recommendation to the department chair.

b. Plan of Study Approval and Advancement to M.S. Degree Candidacy

Upon successful completion of the thesis proposal defense, the student should submit the "Application for Candidacy" form including curriculum track and courses approved and signed by the committee. At the time that the thesis proposal is presented to the thesis committee, an initial draft of the "Application for Candidacy" form should be presented to and approved by the committee. This ensures that the courses taken by a student are approved as relevant to their particular needs and goals and that the student is on track to graduate in a timely manner. This document is to be submitted to the department chair with an attached copy of transcripts (official or unofficial) from SSU graduate study and transcripts from any off campus graduate work to be applied to the degree. Deviations from this initial plan of study may occur due to restrictions in course offerings or other factors. If this occurs, the advisor and committee must approve the revised plan of study and the advisor must initial any course substitutions made on the original "Application for Candidacy" form prior to course registration.

Once students successfully complete their thesis proposal defense and submit the Application for Candidacy form, they move from the classification of "graduate student" to "MS candidate" and is then eligible to enroll in Thesis I. This is independent of whether they have finished their core coursework. This

differs from the candidacy for graduation, which indicates that the student has completed all requirements to graduate from the university.

X. Thesis Preparation

a. Thesis work

Students are expected to begin work on their thesis research immediately upon entering the degree program unless otherwise advised by their advisor or the program coordinator. The general process involves extensive literature reviews and synthesis in the form of draft documents that led to the thesis proposal. After a successful proposal defense, the student enrolls in Thesis I (and then Thesis II) and research areas that were agreed upon by the student and the committee are further developed by the student reading more literature, performing survey or experimental research, and generating drafts for their advisor and/or committee. This process of reading, assimilating information, and exchanging ideas is repeated as the student progresses through the milestones outlined in the MSMS Milestones Checklist.

The work towards a thesis occurs within the classroom as part of coursework and as independent work done on the student's own time. Just as faculty meet with students outside of class time and review student work outside of the formal class setting, graduate-level students are expected to commit this level of work to their individual research projects. Full-time graduate students are expected to be enrolled in a full course load (~9 credit hours). The remaining time of a "fulltime" week, approximately 40 hours per week, are to be used for literature research, data analysis, academic or committee meetings, experimental set up, field work, lab maintenance, or any and all other tasks essential to the research environment and thesis progress. Ideally, the draft should evolve with committee member input as appropriate and over the course of the project. The maturation of the thesis document will be assessed by the advisor and committee over several meetings during the course of the work.

b. Thesis document

For formatting guidelines and a sample thesis template, see the Thesis Guide from the Office of Graduate Studies <https://www.savannahstate.edu/cost/nat-science/docs/Thesis%20GuideMSMS06a.pdf>. The guide should be followed, except please use 1" margins on all sides. There are no specific length or chapter requirements for the thesis document, but it should be agreed upon by the thesis committee and follow the style and format relevant for the field of study. Inquire with your advisor regarding expectations for printed, bound copies.

XI. Thesis Defense

a. Preliminary Thesis Approval and Permission to Defend Form

Once the above stated work yields a complete thesis draft that is approved by the thesis advisor, it should be distributed to the committee for approval and permission to defend. The student must submit the “Preliminary Thesis Approval and Permission to Defend Form”. This form is signed by the advisor and all committee members and should be submitted to the Office of Graduate Studies. This form notifies the University that the student is prepared to graduate from the program. With the final approval of the advisor, the committee and student will decide when to schedule the final thesis defense. This form must include a tentative defense date that is approved by the program coordinator.

b. Scheduling the Thesis Defense

The defense is scheduled only after a student has been given permission to defend evidenced by the Preliminary Thesis Approval and Permission to Defend form. This thesis date reservation should be made with the program coordinator and must fall within program deadlines.

A penultimate draft should be distributed to the committee no later than three (3) weeks before the defense (unless the committee unanimously agrees to a shorter period). The penultimate draft is the next to final version in a series of versions that the thesis committee has reviewed. The final version is the one containing the signed thesis signature page that will be submitted to the Dean of Graduate Studies. The oral thesis defense must be advertised for two weeks in advance of the defense date. The defense should occur no later than four (4) weeks prior to the grade submission deadline for graduating students.

c. The Thesis Defense

The thesis defense consists of two parts: 1) an oral presentation open to the public with a question and answer period, followed by 2) a closed thesis defense attended only by the committee members and the student. The purpose of the closed portion of the thesis defense is mainly, but not exclusively, to address any outstanding concerns based on the oral presentation, to review substantive changes to the penultimate draft submitted before the defense, and to ask questions that will help determine the readiness of the student to graduate. Students should expect questions related to the project, the methods used to perform the work, relevant coursework, and relevant literature.

Students must pass A) the written (thesis document) and B) oral defense (public and closed-door) portions of this assessment in order to pass and receive all committee signatures on the Thesis Defense Report form and thesis cover page. The final approved thesis with committee signatures must be uploaded to the library submission page no later than one week before the final grade deadline

(see current academic calendar). A copy of the submission confirmation should be forwarded to the program coordinator and the Registrar's Office.

The committee may decide the student has provisionally passed, when only minor edits or minor additional tasks are necessary to receive their final approval within a reasonable (at the discretion of the committee) timeframe. The provisions necessary to be completed to meet their approval must be clearly laid out and satisfied under the timeline set by the committee. This timeline can exceed commencement exercises and the committee can either allow or prohibit participation in commencement based on the defense performance and their confidence in the work being completed as laid out in their conditions. Scheduling a defense before the graduation deadline does not ensure that the candidate will graduate as all committee members must sign the thesis cover page attesting that they approve the final written version. Once the conditions have been met and all committee members approve that all conditions were satisfied as laid out at the time of the defense (as indicated by their signatures on the thesis approval page), the final thesis should be uploaded and a the submission confirmation forwarded to the program coordinator and the Registrar's Office.

In the case of a failed performance on either the written thesis or oral thesis defense (public or closed-door sessions), or the conditions laid out for a provisional pass were not met by the end of the timeline approved by the committee, the committee will notify the student, program coordinator, and department chair of the failed thesis defense and the student may be terminated from the program.

d. Thesis Processing

Final theses are published online through ProQuest. The final thesis including the Thesis Signature Page with signatures and thesis defense date must be received by the Office of Graduate Studies and uploaded at least one week before final grades are due. A submission confirmation must be forwarded to the program coordinator and the Registrar's Office for processing of the diploma. Bound copies of the thesis may be ordered and paid for through the library.

Appendix A. Web Resources for MSMS Students

Department of Marine and Environmental Sciences

<https://www.savannahstate.edu/cost/mar-env-science/index.shtml>

Marine Sciences Program

<https://www.savannahstate.edu/cost/mar-env-science/marine-science/index.shtml>

MSMS Program Policies and Forms

<https://www.savannahstate.edu/cost/mar-env-science/marine-science/policies.shtml>

Office of Graduate Studies

<https://www.savannahstate.edu/graduate/>

College of Science and Technology

<https://www.savannahstate.edu/cost/index.shtml>

Appendix B. Faculty Directory of the Department of Marine and Environmental Sciences



Savannah State University

Offering B.S. degrees in Marine Science and Environmental Science, an M.S. degree in Marine Science, and an A.S. in Aquarium Science degree

Our Graduate Faculty & Academic Advisors



Dr. Tara Cox, Associate Professor, Marine Sciences; BSMS Coordinator
coxt@savannahstate.edu
Spatial Ecology, Conservation Biology of Large Marine Vertebrates
Office: MSC 107D
(912) 358-4097



Dr. Dionne Hoskins-Brown, Associate Prof. and Director, NOAA Sponsored Programs.; MSMS Coordinator
hoskinsbrown@savannahstate.edu
Benthic Ecology, Essential Habitat,
Office: MSC 107E
(912) 358-4289



Dr. M. Carla Curran, Professor, Marine Sciences
curranc@savannahstate.edu
Estuarine Ecology, Fish Biology, Parasite-Host Interactions, K-12 Outreach
Office: MSC 108C
(912) 358-4438



Dr. Carol Pride, Professor, Marine Sciences; Department. Chair
pridec@savannahstate.edu
Estuarine Salinification, Identification of Bio-indicator Species, Marine Sediment Records
Office: MSRC 106B
(912) 358-4439



Dr. Sue Ebanks, Associate Professor, Marine and Environmental Sciences
ebankss@savannahstate.edu
Aquatic Invertebrate Responses to Environmental Change
Office: MSC 108A
(912) 358-4430



Dr. Amanda Kaltenberg, Associate Professor, Marine Sciences
kaltenberga@savannahstate.edu
Bio-physical interactions, Coastal Oceanography, Bio-acoustics
Office: MSC 107B
(912) 358-3304



Dr. Chris Hintz, Associate Professor, Marine Sciences
hintzc@savannahstate.edu
Carbonate Chemistry, Ocean Acidification, Technique Development (Alkalinity, pCO₂, pH, pCO₂-controlled culture)
Office: MSC 108D
(912) 358-4096



Dr. Kenneth Sajwan, Professor, Environmental Sciences; Environmental Sciences Coordinator
sajwank@savannahstate.edu
Biogeochemistry of Trace Elements, Coal and Coal Combustion Byproducts, Organic Waste Co-disposal, PAHs, Organochlorine Compounds, and Dioxins
Office: Drew Griffith 111
(912) 358-4440

Instructional Faculty and Professional Staff

Dr. Dwight Ebanks, Instructor,
ebanksd@savannahstate.edu
Office: MSC 108B (912) 358-3307

Dr. Victoria Young, LMRCES Education Expert and Visiting Assistant Professor
youngv@savannahstate.edu
Office: MSC 107C (912) 358-4291

Dr. Shawn Rosenquist, Instructor,
rosenquists@savannahstate.edu
Office: MSC 112 (912) 358-4432

Ms. Robin Perrtree, Marine Science Technician
perrtreer@savannahstate.edu
Office: MSC 111 (912) 358-3301

Ms. Sugeiry Rivera, Administrative Assistant
riveras@savannahstate.edu
Office: MSC 106 (912) 358-4101

Capt. Shawn Smith, Boat Captain/Marine Operations Tech
smithsh@savannahstate.edu
Office: MSC 106A (912) 358-4102

Appendix C. Partners, Collaborators, Funded Programs, Resources, and Employers of Marine and Environmental Sciences Students and Graduates

Our Partnerships & Collaborators

Department of Education (DOEd)
Department of Energy (DOE)
NOAA Living Marine Resources Cooperative
Science Center (LMRCSC)
National Science Foundation (NSF)
Oatland Island Wildlife Center
Savannah Chatham County School System
Sea of Change Foundation
Skidaway Institute of Oceanography (SkIO)

Internships & Fellowships Available

DoEd Title VII NSF REU
NOAA LMRCSC US DOE/EPA

Department Resources

Marine Biology Building (main campus)

Wet and Laboratories
Classroom
Experimental Chambers
Computer Lab/Student Resource Room
Marine Biology Preserved Collections
60 foot floating dock

Marine Science Center (Livingston Ave)

Experimental Chambers
Ultracold Freezers
Wet Laboratory with Sea Pump System
Analytical Computing Laboratory
Dolphin Research Laboratory and Necropsy Facility
Fish Ecology Laboratory
Coastal Biophysics Laboratory
Coastal Geobiology Laboratory
Environmental Toxicology Laboratory
Benthic Ecology Laboratory
Instrumentation Research Laboratory
Mesocosm Laboratory
Water Quality Laboratory
Radiation Laboratory
Standard Research Laboratory
Floating Dock
22 ft Boston Whaler, *Tiger II*
36 ft (22 PAX) Newton, *Margaret C. Robinson*
25 ft, (24 PAX) Rookie Flat Tour Boat

Herty Hall

GIS Laboratory

Where Are Our Students Working Now?

Chatham County Engineering
City of Savannah
The Georgia Aquarium
Georgia Department of Natural Resources
Grand Bahama Port Authority
Loggerhead Marine life Center, Juno Beach, FL
Meritech Environmental Laboratory, NC
Mote Marine Laboratory
Natural Fisheries Research Center, Gainesville, FL
National Zoo, Fairfax, Virginia
NOAA Corps
NOAA Fisheries
Savannah Chatham County Public Schools
Savannah State University
Sea Turtle Program, Ossabaw Island, Georgia
SC Department of Natural Resources
T. Baker Smith, LLC Consulting Company
Tennessee Aquarium, Chattanooga, TN
Test America Savannah
The Nature Conservancy's Caribbean Program
Tybee Island Marine Science Center
UGA Marine Extension Service
UGA Shellfish Laboratory
UGA Skidaway Institute of Oceanography
UGA Georgia Coastal Ecosystems Long Term Ecological
Research (GCE-LTER)
US Army Corps of Engineers
United States Navy

Appendix D. MSMS Course Descriptions

MSCI 5201 General Oceanography (3-1-4)

Graduate level survey of the major disciplines of marine science including physics, geology, chemistry, and biology. Emphasis will be placed on global scale processes including forces driving major ocean currents, tectonic activity, equilibrium chemistry, chemical and biological processes involved in nutrient cycling, and the determinants and effects of global climate change on major ocean processes. Prerequisite: physics, chemistry or biology.

MSCI 5202 Introduction to Coastal Oceanography (3-1-4)

The course will consist of a variety of lectures, labs, and field experiences related to coastal oceanographic processes. Topics will include coastal physical oceanography (tides, wind driven currents, estuarine processes, and stratification), coastal geology (depositional and erosion in coastal and offshore regions), biology, and biogeochemical cycling in the coastal zone (benthic and water column processes). Prerequisite: MSCI 5201

MSCI 5401 Technical Writing and Communication (3-0-3)

Explores the elements of communicating scientific and technical information. It provides an overview of communication design, audiences, formats, style, mechanics, graphics, literature search, manuscript preparation, and seminar presentation.

MSCI 5402 Research/Marine Science Seminar (1-0-1)

Participation in preparation, presentation, and discussion of marine-related seminar topics.

MSCI 5403 Research/Marine Science Seminar II (1-0-1)

Participation in preparation, presentation, and discussion of marine-related seminar topics.

MSCI 5501 Fish Ecology (3-0-3)

Presents the differences in morphology, ecology, behavior and life-history traits of the most common groups of cartilaginous and bony fishes. The course structure is based on an overview of each fish group followed by active discussion of specific ecological characteristics of families and/or species based on primary literature selected by students.

MSCI 5560 Advanced Environmetrics (3-0-3) Reviews linear statistical methods and teaches

nonparametric approaches to treat environmental/biological data. May include but not be limited to power tests, randomization, and experimental design, analyses of variance, covariance and deviance, simple to polynomial regression, non-parametric tests of significance, pairwise and multiple comparisons, and response surfaces. Prerequisite: statistics.

MSCI 6202 Advanced Oceanography (3-0-3)

A continuation of principles introduced in MSCI 5201 Introduction to Marine Sciences. Lectures and problem sets will develop a working knowledge of physical and chemical ocean processes, particular those important to continental shelves and other upwelling environments. Physical processes that will be discussed include buoyancy input, wind forcing, tidal stirring, tidal rectification, and seasonal mean circulation. Chemical processes that will be discussed include kinetic predictions for reactions in seawater, vertical and horizontal transport of materials, isotopic clocks and tracers, nutrients, and chemical fluxes across major marine interfaces, including estuaries. Fundamental physical, chemical, and biological interactions will be explored using readings and sample problems. Prerequisites: College Physics, Chemistry, Calculus, and MSCI 5201 Introduction to Marine Sciences.

MSCI 6310 Scientific Ethics (3-0-3)

The basics in philosophical and ethical thought in science, expanded to include the faculty/student relationship, peer review, data treatment, analysis and interpretation of data, funding sources and competition, proprietary research, politics of science in America and abroad (what factors shape funding emphases, how research foci vary regionally and globally). Prerequisites: None

MSCI 6323 Coastal Law and Policy (3-0-3)

An exploration of common federal and state law principles and legislation affecting uses of the lands, waters, and natural resources of the coastline and the adjacent ocean waters. Topics studied include doctrines defining public and private property rights in the shoreline and submerged lands, coastal wetlands protection, beach management, marine fisheries, aquaculture regulation, marine protected species in coastal areas, pollution control, energy and mineral development, food sources, marine transportation, and coastal land use control. Prerequisites: None

MSCI 6324 Coastal Zone Management (3-0-3)

All coastal states now cooperate with the U.S. Government in managing the coastal zone to maximize human and natural value. The laws, regulations, policies, public goals, and agencies involved in this effort will be described and evaluated for effectiveness. Prerequisites: None

MSCI 6542 Fisheries Population Dynamics (3-0-3)

Formulation and use of mathematical models used in stock assessment of commercial and recreational fisheries. Includes stock concept, estimation of growth, mortality rates, gear selectivity, estimating CPUE, maximum sustainable yield, stock/recruitment relationships, analytical and holistic models, data requirements and start to finish methods for fisheries stock assessment reports. Microcomputer modeling and analysis packages will be used. Prerequisite: calculus.

MSCI 6546 Mariculture (2-0-2)

Introduction to the principles and practice of the culture of marine organisms. Includes site selection, water quality, production systems, feeds and nutrition, health, broodstock management and husbandry, and economics, an overview of finfish, molluscan, crustacean, and aquatic plant culture, physiology of growth and reproduction including exposure to advanced technology (e.g. molecular methods, neuroendocrinology). Prerequisites: biology, MSCI 5201.

MSCI 6550 Analytical Techniques in Seawater, Sediments, and Soils (0-3-3).

Students will obtain competency in a variety of analytical techniques for the analysis of seawater, marine sediments, and soils. Nutrient analysis, chemical constituents, contaminant analysis including both organic and inorganic contaminants, and bacteriological water quality. Prerequisite: chemistry.

MSCI 6552 Marine Biotechnology (3-1-4)

An overview of concepts, approaches, techniques, and applications of biotechnology with emphasis on marine biotechnology. Principles of recombinant DNA technology, its relevance to genetic engineering, and its uses in basic and applied biology. Methodology and concepts of genetic engineering technology; molecular mechanisms of gene transfer, integration, and expression of transgenes in target tissues/organisms. Applications of marine biotechnology in aquaculture, marine environmental protection, the use of transgenic fish, production of fuels from algae and natural products of pharmaceutical value from marine organisms, and other applications. Prerequisite: genetics.

MSCI 6560 Oceanographic Data Methods (3-0-3)

A course in analytical tools used in oceanographic research including time-series analysis, sampling theory and design, and database management. Students will become proficient in scripting in at least one data analysis software program (MATLAB, R, Ocean Data View, SPSS, SAS, etc.) using example data sets commonly collected from ocean observatories, satellite remote sensing, data loggers, tagging and tracking experiments, moorings, current meters, long-term climate data sets, and related oceanographic data. Prerequisites: None

MSCI 6562 Remote Sensing (3-0-3)

Principles, characteristics, and applications of environmental remote sensing. Topics include concepts and foundations of remote sensing photographic systems and interpretation of thermal and multispectral scanning radar systems, satellite remote sensing and digital image processing. Aspects of oceanographic data such as phytoplankton abundance, sea-surface temperatures, ocean wind speeds and instrumentation such as SeaWiFS, AVHRR, and SSM/I will be emphasized. Prerequisites: calculus, statistics.

MSCI 6572 Advanced Oceanographic Instrumentation (3-0-3)

Graduate overview of oceanographic instrumentation commonly used aboard oceanographic research vessels, by marine laboratories, and remote sensing platforms. Covers the physical, chemical, electrical, acoustic and mechanical basis for these instruments' operation. Introduces instrument deployment and retrieval. Discusses modes of communication, telemetry, and data management.

MSCI 6725 Coastal Wetland Ecology (3-0-3)

Introduction to coastal wetlands (brackish/fresh water marshes, swamps, and bogs), with an emphasis on typical southeast US flora and fauna. Wetland physical diagnostic characteristics (hydrology, pedology), as well as biological parameters (primary productivity, biogeochemistry, and nutrient transport), will be covered. Prerequisites: None

MSCI 6726 Coastal Botany (3-1-4)

Identification, classification, the ecology of coastal plants and algae; wetland and barrier island plant communities and functions; physiological ecology of coastal plants and algae. Prerequisite: botany or ecology.

MSCI 6745 Aquatic Pathology (3-1-4)

Systematics, life history, spread, etiology, diagnoses, and treatment of selected diseases among shellfish, fish, and marine mammals. Viral, bacterial, fungal, protozoan, and invertebrate pathogens. The importance of aquatic diseases in aquaculture and to public health. Prerequisite: biology.

MSCI 6747 Marine Mammalogy (3-0-3)

Natural history, taxonomy, anatomy, physiology, ecology, conservation, and economic importance of the cetacea, pinnipedia, and sirenia. Prerequisite: biology.

MSCI 6781 Benthic Ecology (3-0-3)

Ecology course describing the general chemical, biological, and physical nature of the sediment environment, comparing these traits across saltmarsh, deep sea and shelf habitats. Including trophic relationships and distribution of organisms, the role of microbial communities, the formation of detritus, and sediment transport.

MSCI 7344 Fisheries Management (3-0-3)

Environmental ecology, conservation, and processes used to manage living marine and aquatic resources harvested or otherwise impacted by human activities. Examples from global, regional, and local areas will be highlighted.

MSCI 7527 Coastal Environmental Certifications (3-0-3)

Provides background, basis in law, descriptions, and requirements for a variety of certifications and training associated with environmental regulation compliance in coastal areas.

MSCI 7562 Advanced Seminar in Remote Sensing (2-1-3)

The course will build on principles covered in Remote Sensing MSCI 6562. Topics will include satellite, airborne and in situ ocean sensors and their use for observing planetary, regional, and local scale oceanographic process. Visiting experts in remote sensing will augment lectures and student-led discussions. The student will be required to present lectures on specific topics and conduct individual or group research-based projects in remote sensing. Prerequisites: MSCI 6562 Remote Sensing and MSCI 7564 Geographic Information Systems and Database Management in Coastal Systems.

MSCI 7564 Geographic Information Systems and Database Management in Coastal Studies (3-1-4)

Theory, concepts, limitations, and implementation of geographical spatial analysis systems for the study of coastal processes. Through a “hands-on” approach, students will become familiar with the use of GIS and other information management systems for analysis of complex large databases pertaining to coastal processes.

MSCI 7728 Coastal Processes (3-0-3)

Changes in the highly dynamic coastal environment are best understood by evaluating the major physical processes that control coastal configuration, including tides and currents, storm impacts, sea level change, sediment transport, barrier island, and delta formation, and river input. In addition, organism impacts on the coastal environment will also be evaluated (marsh vegetation, dune vegetation, human alterations, estuarine nurseries). Prerequisites: MSCI 5201, MSCI 5202.

MSCI 7743 Fisheries Oceanography (3-0-3)

Introduction to the physical and biological processes (i.e., recruitment variability, compensatory mechanisms, and species interactions) that control the abundance of living marine resource populations. Includes case studies of contemporary multidisciplinary research.

MSCI 7754 Marine Biogeochemistry (3-0-3)

Chemistry course, which focuses on the sources, transport, and fate of organic, matter in natural environments including marine sediments, soils, and natural waters. Includes the global carbon cycle, analytical methods in organic geochemistry, geochemistry of organic matter constituents, geochemistry of humic substances. Prerequisite: MSCI 5202.

MSCI 7782 Marine Microbial Ecology (3-0-3)

Emphasizes the diversity and role of microorganisms in marine ecosystems. Nutrient cycles, methods of microbial analysis, genetic diversity, and the functional roles of microorganisms in marine systems.

MSCI 7783 Water Column Ecology (3-0-3)

Major biological processes in the water column of estuarine, coastal, and open sea environments, with emphasis on interactions of biota with marine chemical and physical processes.

MSCI 7801 Directed Research (0-(1-3)-(1-3))

Directed readings or research at the graduate level to meet the needs of individual students. Consent of instructor required. Variable credit.

MSCI 7851 Special Topics ((1-3)-0-(1-3))

Content to be determined each semester. May be repeated. Variable credit.

MSCI 7991 Thesis I (3-0-3)

Thesis research and preparation. Consent of research advisor required.

MSCI 7992 Thesis II (3-0-3)

Thesis research and preparation. Consent of research advisor required. May be repeated.

MSCI 8822 Advanced Methods of Quantitative Analysis (3-0-3)

This course is designed to expose participants to higher level methods systematic inquiry to answer questions requiring quantitative procedures. Its aim is to provide participants the understanding necessary to effectively apply the tools of multivariate statistical analysis in the appropriate circumstance. An additional purpose of this course is to prepare participants for careers in the research sciences or higher level graduate studies.