



**UNIVERSITY OF  
GEORGIA**

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University Council

August 16, 2019

UNIVERSITY CURRICULUM COMMITTEE – 2019-2020

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Ex-Officio – Provost S. Jack Hu

Undergraduate Student Representative – TBD

Graduate Student Representative – TBD

Dear Colleagues:

The attached proposal from the Franklin College of Arts and Sciences for a new major in Ocean Science (B.S.) will be an agenda item for the August 23, 2019, Full University Curriculum Committee meeting.

Sincerely,

John Maerz, Chair

University Curriculum Committee

cc: Provost S. Jack Hu  
Dr. Rahul Shrivastav

**USG ACADEMIC PROGRAM PROPOSAL**  
(Effective 2/22/18)

**Institution:** University of Georgia

**Date Completed at the Institution:** March 5, 2019

**Name of Proposed Program:** Ocean Science (B.S.)

**Degree:** Bachelor of Science

**Major:** Ocean Science

**CIP Code:** 30320101

**School/Division/College:** Franklin College of Arts and Sciences

**Department:** Marine Sciences

**Anticipated Implementation Date:** Fall 2020

**Requesting Differential Tuition Rate**     Yes<sup>1</sup>     No

**Delivery Mode (Check all that apply):**

On-campus, face-to-face only	X
Off-campus location, face-to-face only (specify the location): “Coastal Semester” at UGA Skidaway Institute of Oceanography, Savannah GA	X
Online Only If this program will be offered online, within two weeks after Board approval, the USG institution must upload requisite information into Georgia ONmyLINE using the institutional PDA account. See Appendix II for the specific questions involved for Georgia ONmyLINE.	
Combination of on-campus and online (specify whether 50% or more is offered online for SACSCOC)	
Combination of off-campus and online (specify whether 50% or more is offered online for SACSCOC)	
Hybrid, combination delivery, but less than 50% of the total program is online based on SACSCOC	
Contractual Location (specify the location and timeframe/start and end dates):	

<sup>1</sup> All documents and forms requesting a differential tuition rate must be submitted to the Office of Fiscal Affairs prior to Academic Affairs Review of the Degree Proposal.

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- 1) **Forecast:** If this program was not listed on your one of the past two-year academic forecasts provide an explanation concerning why it was not forecasted, but is submitted at this time.

This proposal was not included in the University of Georgia's Academic Forecast because it had not been submitted through the faculty governance process.

- 2) **Academic Framework:** Within the context of strategic planning of all resources and divisions within short-term and long-term perspectives, provide a narrative that explains campus leadership review and attention to newly institutionally approved programs within the last four years, low-producing programs, and post-approval enrollment analyses prior to approving the proposed program for submission to the system office.

The Office of Instruction reviews newly institutionally approved programs, low-producing programs, and post-approval enrollment to monitor and assess future viability of all programs.

- 3) **Rationale:** Provide the rationale for proposing the new academic program. (*In other words, does the state need the program; should your institution offer the program; and can your institution develop and implement the program.*)

The State of Georgia needs more Ocean Science and Marine Science graduates than are currently produced. The proposed major in Ocean Science (B.S.) will:

- 1) Advance the understanding of ocean environments and ocean ecosystems among the citizens of Georgia and states across the nation;
- 2) Enhance ocean and environmental literacy and critical thinking skills among students in the USG;
- 3) Help train the next generation of ocean and environmental scientists in Georgia and the U.S.;
- 4) Leverage UGA's coastal facilities – the Skidaway Institute of Oceanography and the Marine Institute on Sapelo Island – to provide experiential opportunities for undergraduates through residential teaching and research programs; and
- 5) Provide Ocean Science opportunities for students enrolled at UGA and give students who go out of state to study Oceanography an opportunity to stay in-state.

The University of Georgia has been actively involved in ocean research since the early 1950s, when the Marine Institute was established on Sapelo Island. Today UGA is Georgia's Sea Grant College and boasts some of the finest coastal facilities in the Southeast, including the Skidaway Institute of Oceanography (Skidaway Institute), the UGA Marine Institute (UGAMI), the Center for Research and Education at Wormsloe, and Marine Extension Service facilities on Skidaway Island and in Brunswick. The UGA Department of Marine Sciences was founded in 1992, and in the intervening 25 years it has assembled a world-class faculty (stationed on the Athens campus and at Skidaway Institute) and established a strong, extramurally-funded research program. In calendar year 2017, the 25 Marine Sciences tenured/tenure-track faculty published 92 peer-reviewed papers, presented or co-authored approximately 167 talks at professional meetings and workshops, and were awarded \$8.3 million in externally funded research grants.

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In addition to its achievements in research, the Department of Marine Sciences administers a well-respected graduate program that attracts highly qualified students from around the world. Since the program's inception in 1996, 42 M.S. and 60 Ph.D. degrees have been awarded; the current graduate class size is approximately 30. In the absence of an undergraduate degree program, faculty of the Department are active in undergraduate general education and service teaching, serving about 900 undergraduate students in regular classroom instruction annually.

The combination of an internationally recognized faculty, an extremely active and well-funded research program, a robust graduate program and undergraduate teaching portfolio, and a group of coastal facilities that is unrivaled in the Southeast, represents an invaluable resource for the state of Georgia. Establishing a major in Ocean Science (B.S.) at UGA will provide undergraduate students the opportunity to benefit from all these resources, will prepare those students for jobs related to the complex and urgent environmental challenges that society faces, and will elevate the profile and improve the educational reputation of UGA and the USG system. The need to fully integrate recently added Skidaway Institute of Oceanography faculty into the instructional mission of UGA makes this a unique window of opportunity to start the UGA major in Ocean Science (B.S.) without hiring new faculty.

- 4) Mission Fit and Disciplinary Trends:** Description of the program's fit with the institutional mission and nationally accepted trends in the discipline (explain in narrative form). If the program is outside the scope of the institutional mission and sector, provide the compelling rationale for submission.

The proposed program will contribute directly to two of the core strategic directions articulated in UGA's 2020 Strategic Plan: "Building on Excellence in Undergraduate Education," and "Improving Stewardship of Natural Resources...". Consistent with these goals, the program will provide undergraduates with the intellectual tools to generate and critically interpret new knowledge. It will foster opportunities for students to learn from and work with internationally recognized faculty. And it will impart to these students a deep understanding of the nature and complexity of natural systems, the relationships between human society and these systems, and the challenges these systems and relationships currently face.

Baccalaureate programs in Marine and Ocean Sciences and closely related fields are increasingly being offered by colleges and universities in the U.S.; Peterson's Guide currently lists 137 such programs among public and private institutions nationwide (up from 98 in 2010). These programs have been developed in response both to tremendous student demand and to acknowledged societal need to address marine-related problems in a rigorous and interdisciplinary way. The table below details the robust Marine and Ocean Sciences undergraduate programs in coastal states neighboring Georgia.

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State	Number of Marine Sciences (or closely related) Programs	Current Statewide Enrollment (2017-2018)*	Statewide B.S. Degrees Awarded (2016-2017)*
Alabama	7	335	39
Florida	12	2,326	361
North Carolina	3	352	106
South Carolina	3	1,372	192
Georgia <sup>1</sup>	1	77	12

\* Unless otherwise indicated, enrollment data is from institutional web pages and/or personal communication with institutional representatives; degree award data is from the National Center for Education Statistics ([nces.ed.gov/ipeds/](http://nces.ed.gov/ipeds/)).

<sup>1</sup> Georgia enrollment data from [savannahstate.edu/irp/enrollment/enrollment-by-major.shtml](http://savannahstate.edu/irp/enrollment/enrollment-by-major.shtml); degree award data from [usg.edu/research/degrees\\_conferred](http://usg.edu/research/degrees_conferred).

The lack of an undergraduate program in Ocean Science at UGA represents a gap that is particularly glaring given this institution’s status as the State’s Sea Grant College, its unparalleled coastal facilities, and its national and international reputation in ocean science disciplines. The program proposed here is a logical extension of the extraordinary marine-related research, instructional, and service activities that are being pursued by UGA faculty and staff.

**5) Description and Objectives:** Program description and objectives (explain in narrative form).

The Ocean Science (B.S.) program will provide undergraduate students with a deep, interdisciplinary understanding of the structure and function of all aspects of the global oceans and their interactions with the earth and atmosphere system and equip them with the critical thinking skills and analytical tools to design, carry out, and interpret scientific studies in a broad range of environmental fields. Faculty on the Athens campus and at Skidaway Institute are engaged in well-funded, cutting-edge research into the physical, chemical, geological, and biological aspects of marine systems on the Georgia coast and around the globe, and as such can provide undergraduates with unparalleled instruction and a diverse range of research opportunities.

We envision a vibrant program in which a large proportion of our majors spend a semester on the coast (highly encouraged, but not required) involved in courses and research. The program will thus leverage UGA coastal facilities (Skidaway Institute and Marine Institute) to provide students with experiential opportunities in the ocean environment. For those students who cannot participate in the coastal semester at Skidaway Institute, we envision a number of different ways that students can meet the requirements: research opportunities are available on campus with our Athens faculty, courses taught at Skidaway Institute can be taken via our distance teaching and learning video conferencing capabilities or other courses will be made available.

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Graduates of this program will be ready to work in a broad range of environmental fields (see Section 6 and 7, below) by virtue of the interdisciplinary nature of the program and its emphasis on critical thinking and analytical skills. Students will also be well-prepared for graduate studies in specific environmentally-related fields.

The specific objectives of the proposed program are:

- To provide students with a substantive knowledge of the natural sciences and an understanding of the nature and practice of modern scientific inquiry.
- To educate students in the breadth of Ocean Science, emphasizing a process-oriented view of marine systems and the interdisciplinary approach required to study them.
- To equip students with the critical thinking and analytical tools to generate, analyze, and interpret scientific data.
- To prepare students to pursue careers in Ocean Science or allied fields.

- 6) **Need:** Description of the justification of need for the program. (Explain in narrative form why the program is required to expand academic offerings at the institution, the data to provide graduates for the workforce, and/or the data in response to specific agency and/or corporation requests in the local or regional area, and/or needs of regional employers.) (A list of resources, not exhaustive, is available on the public web link along with the proposal form at: [http://www.usg.edu/academic\\_programs/new\\_programs](http://www.usg.edu/academic_programs/new_programs))

The need for highly trained professionals in the area of ocean research and education is well-documented (see references in Appendix I). In its most recent report, the NSF Advisory Committee for Geosciences (which includes Ocean Sciences) highlighted the need to “increase undergraduate student exposure to the geosciences overall and increase the number of undergraduate students earning Bachelor’s degrees in geoscience majors” (Appendix I, ref 1). It has been estimated that the U.S. production of bachelor’s degrees in geosciences is insufficient to supply anticipated need (Appendix I, ref 4).

Our proposed program will provide students with the knowledge and quantitative skills to participate in a range of ocean environment-related occupations, as illustrated in the table below. On average, jobs in these occupations are projected to increase faster than average over the next decade. Just as important, the overall rate of job openings (which includes openings due to replacement as well as job growth) in these fields is much higher than average. The major in Ocean Science (B.S.) will provide a marketable degree pathway for students pursuing a variety of careers related to the coastal and open ocean environment, including natural resources, aquaculture, public policy, and private consulting. Letters of support (see Appendix I) from the GA DNR Coastal Resources Division, the GA Conservancy, the GMC Ecological Planning Group, the US Army Corps of Engineers, and the UGA Marine Extension GA Sea Grant Program are very encouraging, stating that our undergraduate majors will be able to meet a societal need for addressing marine-related problems in a rigorous and interdisciplinary way. Also, according to the Bureau of Labor Statistics Occupational Outlook Handbook, “employment of geoscientists is projected to grow 14 percent (above average) from 2016 to 2026, faster than the average for all

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occupations. The need for energy, environmental protection, and responsible land and resource management is projected to spur demand for geoscientists in the future.”

	Net % Change in Job Number [2014 – 2024] (6.5% is US average)	Job Openings <sup>1</sup> [2014 – 2024] as % of 2014 jobs (30.9% is US average)
Natural sciences managers	3.3	24.1
Environmental engineering technicians	10.0	34.4
Zoologists and wildlife biologists	4.0	31.0
Conservation scientists	6.9	50.2
Environmental scientists and specialists	10.7	41.5
Geoscientists	10.5	41.2
Geological and petroleum technicians	11.8	48.5
Environmental science and protection technicians	9.5	51.4
Life, physical, and social science technicians	6.8	48.7
Atmospheric, earth, marine, and space sciences teachers, postsecondary	8.7	26.5
All occupations listed here	8.1	40.7

Source: US Department of Labor

<sup>1</sup>Job Openings includes openings due to replacement as well as growth

If we wait to implement this program, there are significant risks. First, there are societal risks of not being able to meet the significant projected demand in the field for environmental analysts with Ocean Science skills in the coming decade. Second, we risk falling behind other university systems in the Southeast and the Nation as they continue to develop ocean-related programs (as noted in Section 4). Third, we risk squandering a unique opportunity to improve Ocean Science education in Georgia by leveraging our coastal facilities.

- 7) Demand:** Please describe the demand for the proposed program. Include in this description the supporting data from 1) existing and potential students and 2) requests from regional industries. How does the program of study meet student needs and employer requirements in terms of career readiness and employability, requirements to enter the profession, post-graduate study, and disciplinary rigor at the level required for professional success and advanced educational pursuits? *(In other words, how does the program of study prepare students for the next step?)*

There is considerable evidence of demand for an Ocean Science undergraduate major:

- i) Surveys: We teach our upper-division Marine Biology course (MARS 3450) to approximately 120 students per year, and we have surveyed these students about their

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interest in an Ocean Science major. Approximately 46% of respondents indicate that they have an interest in such a major (e.g. 39%, 44%, 53% and 48% in fall 2019, 2017, 2016 and 2015 respectively). Given that a major encompasses third- and fourth-year classes, this corresponds to a potential enrollment of 120 students for the major. In order to be conservative, we assume the realized enrollment by the 4<sup>th</sup> year will be 60 new students or on average 30 students/year.

- ii) Starting in January 2016, a Marine Biology Area of Emphasis has been offered to Biology majors at UGA. As of April 2019, 50 students have declared that Area of Emphasis, again suggesting significant potential interest in an Ocean Science major.
- iii) In 2016 a group of approximately 45 students at UGA self-organized to form the Ocean Initiative Club. This student-led organization focuses on marine conservation and hopes to foster ocean literacy in Athens through education and outreach, citizen science projects, watershed-focused community service, and discussions with UGA researchers working to protect and understand ocean systems. Many of these students have expressed interest in an Ocean Science undergraduate degree offering.
- iv) The Department of Marine Sciences fields a great number of inquiries about the possibility of majoring in Ocean Science at UGA. In 2016 alone 110 students or prospective students signed up via our departmental web site to receive information about undergraduate studies in Ocean Science at UGA. Additionally, the Department receives on the order of 20 direct inquiries each year. Typically, students who are committed to marine studies tell us that they intend to apply for admission to out-of-state universities in neighboring states (e.g., Univ. of South Carolina, Coastal Carolina, UNC-Wilmington, Florida State) but would consider UGA if a degree in Ocean Science was an option. Of course, it is difficult to know how many of these contacts might translate into enrollment in an Ocean Science program at UGA. We have conservatively estimated 12 such enrollments in year 2, climbing to 30 in year 4 (see Section 22).

One career pathway for students with an Ocean Science undergraduate degree is graduate study. We anticipate that undergraduates from our Ocean Science undergraduate major will be well prepared for a graduate degree at any USG graduate program. We also expect that many employers in the state of Georgia will similarly recruit our students for consulting, field/lab technician, resource management and coastal policy-related jobs (see attached letters of support in Appendix I). Since the state of Georgia is lagging behind in the number of undergraduates in Ocean-related degree objectives (see Section 4), it is not unreasonable to assume that college graduates from out of state are currently fulfilling the job opportunities that are available in the state of Georgia.

- 8) Duplication:** Description of how the program does not present duplication of existing academic offerings in the geographic area, within the system as a whole, and within the proposing institution regardless of academic unit. If similar programs exist, indicate why these existing programs are not sufficient to address need and demand in the state/institution's service region and how the proposed program is demonstrably different or complementary to other USG degrees and majors.

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The Marine Sciences (B.S.) program at Savannah State University (SSU), which has a distinct mission and serves a student body different from UGA, is currently the sole Marine Sciences undergraduate program in the state. The SSU program has served its students for over 30 years. However, the existence of significant interest in an Ocean Science (B.S.) program among UGA students (see Section 7, above) and across the state and region (see Section 4, above) demonstrates that a program at UGA would fulfill a demand in the USG system that the current program at SSU cannot meet. We do not anticipate that the UGA program would compete with the SSU program, as there is a significant pool of students who are majoring in other disciplines at UGA despite their interest in Ocean Science or have enrolled in out-of-state programs. It is this pool of present and potential UGA students that the proposed program is designed to serve. We believe that there are enough students in the state and across the nation to make both our programs successful. Our hope is that this program will build a cooperative relationship between UGA and all our coastal institutions.

During the past decade Skidaway Institute faculty (now members of the UGA Department of Marine Sciences) helped develop the master's program in Marine Sciences at SSU, supported undergraduate and graduate research at SSU, and regularly taught graduate-level courses at SSU. The participation of Skidaway Institute faculty in the SSU program enabled that program to grow in an era of decreasing University support. This collaboration enhanced the availability of research opportunities, diversity, and the breadth of course offerings for SSU undergraduate and graduate students. The development of an Ocean Science undergraduate major at UGA will likewise expand educational and research opportunities for students at UGA, SSU, and undergraduates across the state and region.

The ideal ocean scientist is one who has a solid training in chemistry, physics, biology, and geology applied to the marine environment. The proposed major will include such training, in addition to courses in data analytics and marine policy. Our program is designed to give a deep and broad understanding of ocean processes ranging from marine microbial metagenomics and ecology, organic and inorganic biogeochemistry, marine ecosystems and policy, ocean circulation and transport, deep-sea processes, marine geology and integrative modeling. Ocean Science is the study of the global marine environment and our curriculum will leverage the strengths of our faculty, who conduct research from the Arctic to the Antarctic, from the coast to the open ocean, and from the surface to the sea bottom, and will provide instruction on changes that are occurring in these systems from the scale of the molecular microbial world to global climatic processes.

**9.) Collaboration:** Is the program in collaboration with another USG Institution, TCSG institution, private college or university, or other entity?

Yes \_\_\_ or No  X  (place an X beside one)

If yes, list the institution below and include a letter of support from the collaborating institution's leadership (i.e., President or Provost and Vice President for Academic Affairs) for the proposed academic program in Appendix I.

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- 10.) Admission Criteria:** List the admission criteria for the academic program, including standardized test and grade point average requirements for admission into the program. Also, at what point (e.g., credit hours completed) are students admitted to the program.

There are no minimum scores on standardized tests or grade point averages required for admission into the program, but the University of Georgia admission criteria applies to this degree program. Students are admitted into the program in their third year, after completion of 60 credit hours and the program's entrance requirements. To enter the major, students must have completed the following courses with a grade of "C" (2.0) or better: BIOL 1107, CHEM 1211, MATH 2250, PHYS 1111 (or their equivalents). To complete the Ocean Science major, students must complete all major required courses with a grade of "C" (2.0) or better.

### 11.) Curriculum

The curriculum will be designed to be intensive, innovative, and flexible. Most of the courses from all subdisciplines of Ocean Science (physical, chemical, biological, and geological oceanography) are already available. We propose to add three new courses for this major: 1) To give a broad overview of how all subdisciplines are connected, we propose the development of a new introductory course (MARS 3200). 2) Given the need for data literacy and quantitative reasoning skills, we will develop a quantitative analysis of Ocean Data into the curriculum (MARS 4520). 3) Finally, a course that introduces students to the field of marine policy and highlights coastal policy as it applies to Georgia will be developed (MARS 4400).

To take advantage of a world class research facility, each student will be encouraged to spend one semester on the coast at the Skidaway Institute of Oceanography in Savannah, Georgia, in their senior year. Engagement with faculty on the coast in research and field methods will be an important and singular part of the curriculum. Students unable to participate in this semester at Skidaway Institute will be able to satisfy the requirements with research experiences and course work on the Athens campus or in other field locations.

The curriculum will be flexible, taking into account student interests in physical sciences and engineering, life sciences, and/or natural resources and conservation fields, and will draw on knowledge and expertise not only of Marine Sciences faculty, but also of faculty throughout Franklin College and other colleges across UGA (see letter of support in Appendix I). Listed below and in Appendix I are the courses currently offered in the Marine Sciences Department and in other units, as well as new courses that will be part of the core curriculum.

- a. Specify whether the proposed program requires full-time study only, part-time study only, or can be completed either full time or part time.

The program can be completed with either full-time or part-time study, however the coastal semester at Skidaway Institute will be a study away option and full-time attendance will be required.

- b. If the proposed program will be offered online, describe measures taken by the academic unit to sufficiently deliver the program via distance education technologies and provide

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instructional and learning supports for both faculty and students in a virtual environment. Will the program be offered in an asynchronous or synchronous format?

The program will not be offered online.

- c. List the entire course of study required to complete the academic program. Include the course prefixes, course numbers, course titles, and credit hour requirement for each course. Indicate the word “new” beside new courses. Include a program of study.

The course requirements for the major in Ocean Science (B.S.) are listed below. The coursework consists of at least 18 hours of Foundation (Area VI) and at a least 32 hours of major coursework.

### OCEAN SCIENCE B.S. DEGREE REQUIREMENTS

#### General Education Core Curriculum (60 hrs. Total)

Area I – Foundation Courses		9 hrs.
ENGL 1101	English Composition I	3
ENGL 1102	English Composition II	3
<i>Recommended:</i>		
MATH 2250	Calculus I for Science and Engineering	4
Area II – Sciences (At least one of the above must include a laboratory)		7-8 hrs.
<i>Physical Sciences: Recommended:</i>		
CHEM 1211, CHEM 1211L or CHEM 1311H, CHEM 1311L	Freshman Chemistry I  Advanced Fresh Chemistry I (Honors)	 4  4
<i>Life Sciences: Recommended:</i>		
BIOL 1107, BIOL 1107L or BIOL 2107H, BIOL 2107L	Principles of Biology I  Principles of Biology I (Honors)	 4  4
Area III – Quantitative Reasoning		3-4 hrs.
<i>Recommended:</i>		
PHYS 1111-111L* or PHYS 1211-1211L	Introductory Physics – Mechanics, Waves, Thermodynamics Principles of Physics for Scientists and Engineers – Mechanics, Waves, Thermodynamics	 4  4
Area IV – World Language and Culture, Humanities and the Arts		12 hrs.
World Language and Culture (3 courses)		9
Humanities and the Arts (1 course)		3
Area V – Social Sciences		9 hrs.
<i>Recommended:</i>		

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HIST (1 course) 3

*Recommended:*

2 courses from 2 other Depts. (see College of Arts and Sciences list) 6

Area VI – Courses Related to the Program of Study 19 hrs.

BIOL 1108, BIOL 1108L or	Principles of Biology II	4
BIOL 2108 H, BIOL 2108L	Principles of Biology II (Honors)	4
<hr/>		
CHEM 1212 or	Freshman Chemistry II	3
CHEM 1312 H	Advanced Freshman Chemistry II (Honors)	3
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PHYS 1112-1112/L* or	Introductory Physics –Electricity and Magnetism, Optics, Modern Physics	4
PHYS 1212-1212L	Principles of Physics for Scientists and Engineers – Electricity and Magnetism, Optics, Modern Physics	4
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MATH 2260	Calculus II for Science and Engineering	4
<hr/>		
GEOL 1250-1250L	Physical Geology	4

\*PHYS 1211-1211L & PHYS 1212-1212L are recommended for those interested in pursuing physical fields.

Major Requirements (32 hrs. Total)

*Minimum grade of C required for all upper division courses related to Major*

A. MARS Core Courses 20 hrs.

MARS 3200 [new course]	Fundamentals of Ocean Science	3
MARS 4100/6100	Geological and Physical Oceanography	3
MARS 4200/6200	Biological and Chemical Oceanography	3
MARS 4400 [new course]	Intro Marine Policy	3
MARS 4500/6500	Field Study in Oceanography and Marine Methods	5
MARS 4520 [new course]	Quantitative Analysis of Ocean Data	3

B. Major Electives (at least 6 credit hrs. from MARS Courses list) 12 hrs. total

MARS Courses

MARS 3450	Marine Biology	3
MARS 3550	Life in Fluids	3
ENGR(MARS) 4113/6113- 4113L/6113L	Introductory Geophysical Fluid Dynamics with Applications	4

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ENVE(MARS) 4175/6175	Coastal Meteorology	3
MARS(FISH) 4380/6380- 4380L/6380L	Marine Fisheries Biology	3
MARS 4510/6510*	Field Study in Oceanography Marine Methods: Independent Research	3-7
MARS(MIBO) 4620/6620- 4620L/6630L	Microbial Ecology	3
MARS(MATH) 4730/6730	Mathematics of Climate	3
MARS 4810/6810	Global Biogeochemical Cycles	3
MARS 4960*	Undergraduate Research	3

\*Maximum of 3 credits of Undergraduate Research can count toward Major Electives.

Other Major Electives

Note that this list is not exhaustive; other elective courses may be added as appropriate. See Appendix I for a letter signed by other departments supporting our undergraduate major in Ocean Science.

*Life Sciences*

BCMB 3100	Introductory Biochemistry and Molecular Biology	4
BCMB 3600	Genomics and Bioinformatics	3
CBIO 3000-3000L	Comparative Vertebrate Anatomy	4
CBIO(PBIO) 4600/660, CBIO(PBIO) 4600L/6600L	Biology of Protists, Biology of Protists Laboratory	4
ECOL 3220	Biology and Conservation of Marine Mammals	3
ECOL 3500-3500L	Ecology, Ecology Laboratory	4
ECOL 4000/6000	Population and Community Ecology	3
ECOL 4010/6010	Ecosystem Ecology	3
ECOL 4050/6050- 4050L/6050L	Ichthyology	4
ECOL 4070/6070- 4070L/6070L	Invertebrate Biology and Ecology	4
ECOL(FISH)(WASR) 4310/6310-4310L/6310L	Freshwater Ecosystems	4
ECOL(BIOL)(MARS) 4330/6330-4330L/6330L	Tropical Marine Invertebrates	4
FISH(ECOL)(MARS)(WIL KD) 4300/6300, FISH(ECOL)(MARS)(WIL D) 4300L/6300L	Environmental Biology of Fishes, Environmental Biology of Fishes Laboratory	3-4

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FISH 4500/6500, FISH 4500L/6500L	Fish Physiology, Fish Physiology Lab	3-4
GENE 3000-3000D	Evolutionary Biology	4
GENE 3200-3200D	Genetics	4
MIBO 3500	Introductory Microbiology	3
MIBO 4300/6300	Microbial Diversity and Evolution	3
MIBO 4500/6500	Bacterial Symbioses	3
BIOL(WILD) 3700	Animal Behavior	3

*Physical Sciences and Engineering*

ATSC(GEOG) 3110	Climatology	3
ATSC 4116/6116- 4116L/6116L	Introduction to Data Assimilation	3
ATSC(GEOG)(ENGR) 4112	Atmospheric Dynamics	3
ATSC(PHYS)(ENGR) 4131/6131-4131L/6131L	Introductory Atmospheric Physics	3
CHEM 3110	Fundamentals of Physical Chemistry	3
CHEM 3300	Modern Instrumental Methods of Analysis	3
ENGR 3101	Applied Vector Analysis	1
ENVE 3111	Atmospheric Sciences for Engineers	3
ENGR 3160	Fluid Mechanics	3
ENGR(ATSC) 4111/6111- 4111L/6111L	Atmospheric Thermodynamics	3
ENGR(MARS) 4113/6113- 4113L/6113L	Introductory Geophysical Fluid Dynamics with Applications	3
ENVE(MARS) 4175/6175	Coastal Meteorology	3
GEOG(ATSC) 3180	Global Climate Change: Causes and Consequences	3
GEOG 4350/6350- 4350L/6350L	Remote Sensing of Environment	3
GEO 4130/6130	Aqueous Environmental Geochemistry	3
GEO 4510/6510	Marine Micropaleontology	3

*Natural Resources and Conservation*

ECOL 3530	Conservation Biology	3
ENVM 3060	Principles of Resource Economics	3
FANR 3200, FANR 3200L	Ecology of Natural Resources, Ecology of Natural Resources Laboratory	4
FANR 3300-3300D	Economics of Renewable Resources	2
WILD(FISH) 3000	Introduction to Fish and Wildlife Management	2
MARS(FISH) 4380/6380- 4380L/6380L	Marine Fisheries Biology	3
FISH(ECOL)(MARS)(WIL D) 4550/6550-4550L /6550L	Sustainable Aquaculture	4
FISH 5360/7360	Fisheries Management	3



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	ENGL 2400	Multicultural Literature in America	3
	BIOL 1108 and BIOLL	Principles of Biology II Principles of Biology II Laboratory	4
	PEDB 1940	Fitness for Life Swimming	1
Yr. 3, Fall 15 credits	MARS 4200/6200	Biological and Chemical Oceanography	3
	MARS 4100/6100	Geological and Physical Oceanography	3
	MATH 2500	Accelerated Calculus III for Engineering Students	3
	POLS 1101	American Government	3
	HIST 2111	American History to 1865	3
Yr. 3, Spring 16 credits	MATH 2700	Elementary Differential Equations	3
	ENVE(MARS) 4175/6175	Coastal Meteorology	3
	GEOL 1250- 1250L	Physical Geology	4
	<b>MARS 4400</b>	<b>Intro Marine Policy</b> [NEW]**	3
	CMLT 3140	Women Writers of the East and West	3
Yr. 4, Fall 14 credits	MARS 4810/6810	Global Biogeochemical Cycles	3
<b>Skidaway Coastal Semester</b>	<b>MARS 4520</b>	<b>Quantitative Anal. Ocean Data</b> [NEW]**	3
	MARS 4500/6500	Field Study Oceanography and Marine Methods	5
	MARS 4960	Undergraduate Research	3
Yr. 4, Spring 16 credits	MARS 4113/6113- 4113L/6113L	Introductory Geophysical Fluid Dynamics with Applications	4
	ARHI 2300	Art History I: Cave Painting to Michelangelo	3
	ATSC 4116/6116- 4116L/6116L	Introduction to Data Assimilation	3
	ANTH 1102	Introduction to Anthropology	3
	PHIL 2030	Introduction to Ethics	3

\* This is an example of a program of study, details of which may change depending upon specific student interest.

\*\* New courses are identified with [NEW].

- d. State the total number of credit hours required to complete the program, but do not include orientation, freshman year experience, physical education, or health and wellness courses

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that are institutional requirements as defined in the Academic and Student Affairs Handbook, Section 2.3.1 and the Board Policy Manual, 3.8.1.

Students will be required to complete 120 credit hours to complete the major in Ocean Science (B.S.).

- e. Within the appendix, append the course catalog descriptions for new courses and their prerequisite courses. Include the course prefixes, course numbers, course titles, and credit hour requirements.

See Appendix I

- f. If this is an undergraduate program, how does or would the department/institution use eCore, eMajor, or dual enrollment?

Course credit earned in eCore will be transferred to UGA according to the policies set for by UGA and the USG. The B.S. in Ocean Science will not be offered as an online degree and hence is not an eMajor. Dual-enrolled students are eligible for the foundational courses normally taken in years 1 and 2.

- g. If this is a doctoral program, provide the names of four external reviewers of aspirational or comparative peer programs complete with name, title, institution, e-mail address, telephone number, and full mailing address. External reviewers must hold the rank of associate professor or higher in addition to other administrative titles.

N/A

## 12.) PROGRAM OF STUDY-UNDERGRADUATE ONLY

See Section 11.c

### PROGRAM OF STUDY- GRADUATE ONLY (provide the program of study).

N/A

- 13.) **Alternative Curricular Pathway:** What alternative curricular pathways exist (for example for students who were not admitted to the major but are still in satisfactory standing at the institutional level)? Please describe them below and describe how these students are advised about the alternative(s).

Other curricular pathways available to students would be a Biology major with an Area of Emphasis in Marine Biology, an Atmospheric Sciences major administered through Geography, a Bachelor of Science or Arts in Ecology, or a Fisheries and Wildlife degree or a Natural Resource Management and Sustainability degree from the Warnell School of Forestry and Natural Resources. Students will be advised of this alternative by program advisors.

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- 14.) Prior Learning Assessment:** Does the program include credit for prior learning assessment? How will credit be assessed and for what specific courses in the curriculum inclusive of prerequisites? If this is not applicable, indicate “NA” in this section.

N/A

- 15.) Open Educational Resources:** Does the program include open educational resources that have been assessed for quality and permissions, can be connected with related curricular resources, and are mapped to learning outcomes? If this is not applicable, indicate “NA” in this section.

N/A

- 16.) Waiver to Degree-Credit Hour** (if applicable):

- All bachelor’s degree programs require 120-semester credit hours.

Proposed program meets the 120-semester credit hours

- Master’s level programs have a maximum of 36-semester hours. Semester credit-hours for the program of study that are above these requirements require a waiver to degree-credit hour request with this proposal.

N/A

- State whether semester credit-hours exceed maximum limits for the academic program and provide a rationale.

The program does not exceed maximum limits.

- This is not applicable for specialist in education and doctoral programs.

N/A

- 17.) Student Learning Outcomes:** Student Learning outcomes and other associated outcomes of the proposed program (provide a narrative explanation).

After completion of the proposed Ocean Science program, students will have earned a B.S degree that provides a marketable skill set for a variety of careers as discussed previously and noted in the support letters from coastal agencies in Appendix I. Students will have learned the fundamentals of physics, chemistry, geology, and biology of the oceans with a firm understanding of natural and anthropogenic influences impacting the oceans. Students will be prepared for a technical career that includes lab and/or field technician work, consulting in areas of water quality, dredging operations and coastal resources, and working in policy and/or aquaculture endeavors. Specific student learning outcomes we will assess will include:

- Students will use core concepts in Ocean Science to describe and explain natural phenomena.

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- Students will apply concepts from other basic sciences to marine and other natural systems.
- Students will be able to find, access, and evaluate sources of scientific information and data.
- Students will design scientific studies to understand specific aspects of marine systems.
- Students will use quantitative reasoning to interpret data.
- Students will use mathematical modeling and simulation tools to describe marine systems.
- Students will communicate disciplinary concepts and interpretations to scientists in the same and other disciplines, and to laypeople, through a variety of formal and informal written, visual, and oral methods.
- Students will develop an understanding of the complex legal, scientific, and social structures that frame resource issues in the ocean.

These proficiencies will be developed through a combination of traditional classes, experiential learning opportunities, and research participation on the Athens campus, at Skidaway Institute, and/or at other UGA coastal facilities. The capstone experience for many of our majors will be a “coastal semester” at Skidaway Institute, which will involve course work, field instruction, and directed research projects, and will be structured to ensure that students make uninterrupted progress toward their degrees (see Sample Program of Study, above in Section 11).

**18.) Assessment:** Describe institutional programmatic assessments that will be completed to ensure academic quality, viability, and productivity.

All academic programs are reviewed annually to assess student learning outcomes and program outcomes. This program will be also be subject to a Comprehensive Program Review at 7-year intervals as mandated by the USG Board of Regents for all academic programs (*Board of Regents Policy 3.6.3 Comprehensive Program Review*). The program review process includes a thorough self-study by the unit under review and an evaluation by a team of faculty external to the unit, leading to a report with recommendations that inform program and unit decision-making; a follow-up with administrators responsible for the unit occurs after one year of receiving program recommendations. Included in the comprehensive review of the program will be:

- Yearly collection of student learning outcomes data
- Review and analysis of the data
- Quantitative assessment of the overall program quality
- Using assessment results to make recommendations for program improvement

Implementing the student learning outcomes assessment process requires a plan that explains what will be measured, how it will be measured, when the assessment will occur,

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who is responsible for the assessment activities, and how the assessment information will be used. As such, all academic programs need to develop a multi-year assessment plan outlining how each program intends to assess all of its student learning outcomes, focusing on one or two outcomes each year and then cycle through the total collection of program learning outcomes over the comprehensive program review cycle. The new Ocean Science (B.S.) program will follow the same review process to ensure continuous improvement.

**19.) Accreditation:** Describe disciplinary accreditation requirements associated with the program (if applicable, otherwise indicate NA).

N/A

**20.) SACSCOC Institutional Accreditation:** Is program implementation contingent upon SACSCOC action (e.g., substantive change, programmatic level change, etc.)? Please indicate Yes or No. \_\_\_\_\_ No \_\_\_\_\_

## ENROLLMENT SECTION *(Consult with Enrollment Management)*

**21.) Recruitment and Marketing Plan:** What is the institution's recruitment and marketing plan? What is the proposed program's start-up timeline

The marketing and recruitment plan includes announcing the program with UGA, the state, and nationally through targeted marketing, event visits, and advertisements. The department is confident in the ability to fulfill or exceed our average enrollment projection of approximately 20 students per year.

**22.) Enrollment Projections:** Provide projected enrollments for the program specifically during the initial years of implementation.

a) Will enrollments be cohort-based? Yes \_\_\_ or No X (place an X beside one)

b) Explain the rationale used to determine enrollment projections.

The projections below include only students who have declared their major (i.e., 3rd- and 4th-year students). Please see Section 7 above for the rationale supporting these projections. We conservatively project that in year 1 (FY21), 15 students will shift into the new Ocean Science major, and that this number will decrease rapidly in subsequent years. Additionally, we estimate a modest rate of new enrollments to UGA at 12 students for year 2, followed by an increase of 21 and 30 students in years 3 and 4 respectively. For the purposes of this table, students are assumed to enter the major as juniors, to stay in the major as seniors, and to graduate at the end of their senior year. Thus "total majors" for each year reflects juniors entering the major plus seniors already in the major (= juniors from the previous year), calculated as previous year student number + new enrollees – number of students graduating at the end of the previous year.

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If projections are not met, the head of Marine Sciences along with the undergraduate coordinator will develop a recruitment strategy to increase enrollment.

	First FY 2021	Second FY2022	Third FY2023	Fourth FY2024
<b>I. ENROLLMENT PROJECTIONS</b>				
<b>Student Majors</b> (3 <sup>rd</sup> and 4 <sup>th</sup> year)				
Shifted from other programs	15	8	4	0
New to the institution	0	12	21	30
<b>Total Majors</b> (Previous + entering – graduated)	15 (0+15-0)	35 (15+20-0)	45 (35+25-15)	55 (45+30-20)

**23.) Faculty**

- Provide the total number of faculty members that will support this program:   25
- Submit your SACSCOC roster for the proposed degree. **Annotate in parentheses** the person who will have administrative responsibility for the program. Indicate whether any positions listed are projected new hires and currently vacant.

Faculty Name	Rank	Courses Taught (including term, course number & title, credit hours (D, UN, UT, G))*  *Courses in bold are in the proposed major	Academic Degrees & Coursework (relevant to courses taught, including institution & major; list specific graduate coursework, if needed)	Current Workload  <i>%EFT Admin, Research, Instruction, Service</i>	Other Qualifications & Comments (related to courses taught)  <i>Area of Specialization</i>
<b>Marine Sciences / Athens Faculty</b>					
Merryl Alber	Professor and UGA Marine Institute Director	<u>MARS 8210</u> Coast Mar Policy, 3(G / Sp)	BS, PhD, Boston University/MBL, Biology	17% A 43% R 5% I 10% S	Marine ecology and coastal policy
Holly Buk	Assistant Professor	New hire effective Dec 1, 2019			marine microbial eukaryotes
Brian Binder (Undergrad Coordinator)	Associate Professor	<b><u>MARS 3450</u></b> Mar Bio, 3(UN / Fa); <u>MARS 1020/L</u> Bio Mar Env, 4(UN / Sp); <u>BIOL 2108H</u> Princ Bio Hon, 3(UN / Fa)	BS, PhD, MIT/WHOI, Biological Oceanography	30% R 45% I	Ecology and physiology of marine phytoplankton

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Adrian Burd	Associate Professor	<b><u>MARS 3550 Life Fluids, 3(UN / Sp);</u></b> <b><u>MARS 4730 Math Climate, 3(UN / Sp);</u></b> <u>MARS 7380 Quant Meth Mar Sci, 3(G / Fa);</u> <u>MARS 8510 Model Mar Sys, 3(G / Fa)</u>	BS, M.A.St, D.Phil, Sussex University, UK, Physics and Astronomy	50% R 25% I	Modelling of biological and chemical processes; Physics
Renato Castelao	Associate Professor	<u>MARS 1010/L Mar Env, 4(UN / Fa);</u> <u>MARS 1011 Mar Env, 3(UN / Sp);</u> <u>MARS 1030 Migration Sea, 3(UN / Fa);</u> <u>MARS 8100 Est Coast Ocean, 3(G / Fa)</u>	BS, MS, PhD Oregon State University, Physical Oceanography	50% R 25% I	Coastal ocean dynamics and its impact on the marine ecosystem
Daniela Di Iorio (Dept Head)	Professor and Dept Head for Marine Sciences	<b><u>MARS 4100 Phys Proc, 3(UN / Sp);</u></b> <u>MARS 8030 Phys Ocean, 3(G / Sp);</u> <u>MARS 8170 Ocean Mix, 3(G / Fa);</u> <u>MARS 8150 Ocean Waves, 3(G / Fa)</u>	BS, PhD, University of Victoria, Canada, Physics	25% A 25% R 25% I	Buoyancy driven flows; circulation and transport processes
James T Hollibaugh	Distinguished Research Professor	<b><u>MARS 3450 Mar Bio, 3(UN / Fa)</u></b>	BS, PhD, Dalhousie Univ, Canada, Oceanography	50% R 25% I	Structure and function of microbial communities
Brian Hopkinson	Associate Professor	<u>BIOL 2108H Princ Bio, 3(UN / Fa);</u> <b><u>MARS 3450 Mar Bio, 3(UN / Fa)</u></b>	BS, PhD, UC San Diego, Oceanography	50% R 25% I	Biology and physiology of photosynthetic marine organisms
Charles Hopkinson	Professor	<b><u>MARS 4500 Field Stud Oceanogr, 5(UN / Su);</u></b> <u>MARS 8160 Mar Ecology, 3(G / Fa)</u>	BS, MS, PhD, Louisiana State University, Marine Sciences	50% R 25% I	Biogeochemistry and ecology of watersheds, wetlands, estuaries and continental shelves;

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Samantha Joye	UGA Athletic Association Professor of Arts and Sciences	<b><u>MARS 4620/6620 Microb Ecol, 3(UN-G / Fa);</u></b> <b><u>MARS 3100 Ocean Peril, 3(UN / Fa)</u></b>	BS, PhD, UNC Chapel Hill, Chemistry	50% R 25% I	Feedbacks between environmental, microbiological, and biogeochemical dynamics; ocean microbiome science
Patricia Medeiros	Associate Professor	<b><u>MARS 1011 Mar Env, 4(UN / Sp);</u></b> <b><u>MARS 1030 Migrations Sea, 3(UN / Fa);</u></b>	BS, MS, PhD, Oregon State University, Environmental Sciences – chemical oceanography	50% R 25% I	Organic and isotope geochemistry
Christof Meile	Professor	<b><u>MARS 4100 Phys Proc, 3(UN / Sp);</u></b> <b><u>MARS 4810 Global Biogeochem Cycles 3(UN / Sp);</u></b> <b><u>MARS 1010 Mar Env, 4(UN / Fa);</u></b> <b><u>MARS 8020 Chem Ocean, 3 (G / Sp)</u></b>	Dipl Nat. wiss, MS, PhD, Utrecht University, The Netherlands, Geochemistry	50% R 25% I	Reactive-Transport Modeling and Biogeochemical Cycling
William Miller	Professor	<b><u>MARS 1010 Mar Env, 4(UN / Fa);</u></b>	BA, MS, PhD, University of Rhode Island, Chemical Oceanography	50% R 25% I	Photochemical reactions and their effect on aquatic carbon cycles
Mary Ann Moran	Regents' Professor, Distinguished Research Professor	<b><u>MARS 3450 Mar Bio, 3(UN / Sp);</u></b>	BS, MS, PhD, University of Georgia, Ecology	50% R 25% I	Bacterial roles in the marine carbon and sulfur cycles
Amanda Spivak	Associate Professor	<b><u>MARS 4225 Method Mar Ecol 3 (UN);</u></b> MARS 8110, Mar Sediment Diagenesis, 3 (G); <b><u>MARS 8010 Bio Ocean, 3(G / Fa);</u></b>	AB, PhD College of William and Mary, Marine Sciences	50% R 25% I	Coastal ecosystem ecology; global carbon cycle; sediment biogeochemistry
Patricia Yager	Professor	<b><u>MARS 4200/6200 Chem/Bio Ocean, 3(UN-G / Fa);</u></b> <b><u>MARS 8050 Clim Ocean Mar Bio, 3(G / Fa)</u></b>	BS, MS, PhD, University of Washington, Oceanography	50% R 25% I	Feedbacks between climate and marine ecosystems
<b>Marine Sciences / Skidaway Institute Faculty</b>					

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Clark Alexander	Professor and Director of Skidaway Institute of Oceanography	<b>MARS 3200 Fund Marine Sci, 3 (UN)†</b>	BA, BS, MS, PhD, NC State, Marine Sedimentology	50% A 40% R 10% I ††	Coastal and marine sedimentary processes; Geological oceanography
Jay Brandes	Professor	<b>MARS 4200/6200 Chem/Bio Ocean, 3(UN-G / Sp);†</b> <b>MARS 4810/6810 Global Biogeochem Cycles, 3(UN&amp;G / Fa) †</b> <u>MARS 8020 Chem Ocean, 3(G / Sp)</u>	BS, MS, PhD, University of Washington, Oceanography	60% R 15% I	Stable isotopes to determine sources and diagenesis of organic compounds and nutrients
Clifton Buck	Assistant Professor	<u>MARS 1011E Mar Env, 3(UN / Sp &amp; Su);</u>	BS, PhD, Florida State University, Oceanography	60% R 15% I	Dissolved and particulate trace metals in marine systems
Catherine Edwards	Assistant Professor	<b>MARS 4520 Quant Anal Ocean Data, 3(UN / Fa)†</b>	BS, PhD, UNC Chapel Hill, Marine Sciences	75% R ††	Coastal physical oceanography and marine robotics
Marc Frischer	Professor	<b>MARS 4400 Intro Mar Policy, 3(UN / Fa);†</b> <b>MARS 4500 Field Stud Oceanogr, 5(UN / Fa) †</b>	AB, PhD, University of South Florida, Marine Sciences	75% R ††	Molecular biology in plankton ecology
Adam Greer	Assistant Professor	New hire effective Dec 1, 2019			Zooplankton ecology
Daniel Ohnemus	Assistant Professor	<b>MARS 4200 Bio &amp; Chem Oc, 3(U / Fa)</b>	BA, PhD MIT/WHOI Chemical Oceanography	60% R 15% I	Trace element marine biogeochemistry ; modeling of marine particle composition, cycling and transformations
Dana Savidge	Associate Professor	<b>MARS 4100 Phys Proc, 3(UN / Sp)†</b>	BA, MS, PhD, UNC Chapel Hill, Marine Sciences	75% R ††	Transport of water from open ocean to shelf settings

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William Savidge	Assistant Professor	<b>MARS 4500 Field Stud Oceanogr, 5(UN / Fa) †</b>	BS, MS, PhD, NC State University, Oceanography	75% R ††	Estuarine water quality, continental shelf oceanography, new technologies for ocean observation
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*F, P: Full-time or Part-time; D, UN, UT, G: Developmental, Undergraduate Non-transferable, Undergraduate Transferable, Graduate*

† Projected new course assignments. Examples only; actual teaching assignments will be made by the Head per departmental policies.

†† Instructional EFT will be adjusted to reflect increased teaching activity under the major

c) Does the institution require additional faculty to establish and implement the program?

Yes or No.  Yes  No \_\_\_\_\_ Please indicate your answer in the space provided.

Describe the institutional plan for recruiting additional faculty members in terms of required qualifications, financial preparations, timetable for adding faculty, and whether resources were shifted from other academic units, programs, or derived from other sources. Explain clearly whether additional faculty hires can be supported with institutional funds.

The major in Ocean Science (B.S.) can be staffed initially using existing faculty in Athens and at Skidaway Institute. The Department of Marine Sciences has hired a top-quality faculty member who started January 2019, and a joint hire with Bioinformatics will start December 1, 2019. Skidaway Institute also hired a top-quality faculty member who started September 2018, and another hire will begin December 1, 2019. With these positions, this program does not require additional faculty at this time. In subsequent years it may be necessary to recruit faculty to support and expand our undergraduate teaching mission should this become necessary due to increased enrollments. Such faculty will have an interest and specialization in UGA’s Signature Research Theme of Safeguarding and Sustaining our World.

## 24.) Fiscal, Tuition, and Estimated Budget

a) Describe the resources that will be used specifically for the program.

The Department of Marine Sciences maintains a fully equipped classroom that accommodates 48 students (Marine Sciences Building room 239), complete with a presentation system and video conferencing capabilities to connect with faculty and students at the coast. In addition, the Department maintains a teaching laboratory (room 139) that can accommodate 20 students. Both the teaching classroom and laboratory meet ADA accessibility requirements. Equipment in the instructional laboratory includes microscopes, incubators, a chemical fume hood, light rack, cold room, 1500 gallons of salt water aquaria that house marine specimens, and a computer room with 20 iMac stations. Undergraduate directed-studies projects are available in ancillary spaces adjoining the instructional laboratory. Field equipment includes water quality test kits, dissolved oxygen and pH probes, current/water flow meters, meter and quarter meter

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square collapsible plot grids, fish traps, an otter trawl, oceanographic secchi disk, and other equipment to support basic field studies in Ocean Science. Finally, Marine Sciences faculty regularly accept undergraduate student researchers in their laboratories for course credit or internships.

Skidaway Institute of Oceanography will have a newly renovated Historic Cattle Barn with new research, education, and outreach space that will include: a large teaching lab that can accommodate 26 students, two high-tech classrooms with distance learning technology that can accommodate 20 students each, several offices, and science exhibition spaces. To assure that these spaces meet the needs of the Ocean Science major, Skidaway Institute has contributed \$200,000 to the project in addition to those funds allocated by the legislature. Construction began December 2018 and a completion date is for summer 2019. Skidaway Institute operates a small fleet of research vessels, ranging from small skiffs suitable for inshore work, up to the 92-foot ocean-going Research Vessel (RV) Savannah, which operates primarily in shelf waters from Chesapeake Bay to the Gulf of Mexico.

We plan to build a unique undergraduate program and transformational experience for undergraduates studying Ocean Science that has a strong component of field-based experiential learning at the Skidaway Institute. Typically, we will make use of small boats to get students out into the field for educational purposes. When a larger platform is needed for more advanced or capstone courses, Skidaway Institute was awarded an enhancement to their base budget in FY2019 to provide five ship days for UGA undergraduate experiential learning. These ship days will be available to the new undergraduate major on a competitive basis when appropriate courses are offered. Each year we plan to submit a proposal for at least 2 of these days so students can experience an overnight stay out on the ocean and measurements can be made over a number of tidal cycles. Skidaway Institute also has on-campus housing that can accommodate students for the planned coastal semester. Skidaway Institute faculty regularly offer undergraduate summer internships and research opportunities in their laboratories.

- b) Does the program require a tuition cost structure different from or above a regular tuition designation for the degree level? Yes \_\_\_\_\_ or No  X  (place an X beside one)
- c) Does the program require a special fee for the proposed program? Yes \_\_\_\_\_ or No  X  (place an X beside one)
- d) If the program requires a different tuition cost structure or special fee, such requests require approval through both the Committee on Academic Affairs (for the academic program) and the Committee on Fiscal Affairs (for the tuition increase or special fee designation). The resultant tuition and/or fee request for a new degree is to be submitted to both the academic affairs and fiscal affairs offices. Complete Appendix III that includes information for a differential tuition cost structure involving a proposal for a new academic program.
- No special fees or different tuition is required.
- e) Note: The web link for approved tuition and fees for USG institutions is located at the following url: [http://www.usg.edu/fiscal\\_affairs/tuition\\_and\\_fees](http://www.usg.edu/fiscal_affairs/tuition_and_fees)

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f) Budget Instructions: Complete the form further below and **provide a narrative to address each of the following:**

g) For Expenditures (*ensure that the narrative matches the table*):

- i. Provide a description of institutional resources that will be required for the program (e.g., personnel, library, equipment, laboratories, supplies, and capital expenditures at program start-up and recurring).

All faculty resources needed for the program are pre-existing. The faculty members from Marine Sciences in Athens and at Skidaway Institute will fulfill the instructional needs in the proposed program.

Required institutional resources include equipment for a new teaching laboratory and for experiential field work on the Skidaway Institute campus (one-time expense of \$83,000 for the first year), and partial support for the Marine Sciences undergraduate coordinator starting the second year of the program (~\$9,000 /yr.).

Skidaway Institute received state bond funds to renovate their existing 13,300 square foot cattle show barn into a modern research, educational, and outreach space in time for the fall 2020 initiation of the program. We request a one-time allocation of \$83,000 to equip this new teaching lab with appropriate instrumentation (see Appendix I for a detailed list of equipment and support letter for these funds). The Department of Marine Sciences will support \$15,000 toward the equipment startup, Skidaway Institute will support \$25,000, and Franklin College will support the remaining \$43,000 by the end of FY21.

Faculty support includes the equivalent of one month of summer salary for the undergraduate coordinator, funded by either departmental state accounts or UGA's IDC return to the Department, starting in the second year of the program FY22.

- ii. If the program involves reassigning existing faculty and/or staff, include the specific costs/expenses associated with reassigning faculty and staff to support the program (e.g., cost of part-time faculty to cover courses currently being taught by faculty being reassigned to the new program, or portion of full-time faculty workload and salary allocated to the program).

In the short term, the Department of Marine Sciences has committed to staffing the necessary courses using existing faculty resources. No new funds are requested to reassign existing faculty for new teaching responsibilities. All of the courses that make up the undergraduate major can be staffed using existing personnel. In the long-term, additional hires in the Department of Marine Sciences will strengthen the breadth and depth of the program as it grows.

No additional staffing will be necessary for administrative support of the undergraduate program. Currently our Student Affairs Professional III oversees our graduate program administration as well as other departmental duties. Some of these other departmental duties will be distributed to our Administrative Specialist so that the Student Affairs Professional III will be able to provide administrative support for both our graduate and undergraduate programs.

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h.) For Revenue (*ensure that the narrative matches the table*):

i. If using existing funds, provide a specific and detailed plan indicating the following three items: source of existing funds being reallocated; how the existing resources will be reallocated to specific costs for the new program; and the impact the redirection will have on units that lose funding.

- Source of existing funds being reallocated

Existing faculty lines budgeted for instruction will be utilized to cover instructional costs associated with all courses. Funding to support the one-time purchase of teaching lab and field equipment at Skidaway Institute (\$83,000) will come from the Department of Marine Sciences, Skidaway Institute, and Franklin College (see Appendix I for letter of support). The Department of Marine Sciences will also support one month of summer salary for the undergraduate coordinator (\$9,000) starting in the second year in FY22.

- How the existing resources will be reallocated to specific costs for the new program

Instructional time for existing and newly authorized faculty lines will be used to cover the needed program instruction.

- The impact the redirection will have on units that lose funding

No funding or instruction will be lost by other units as a result of this program.

ii. Explain how the new tuition amounts are calculated.

Student tuition is set by the University of Georgia for undergraduate students. Tuition is calculated from the 2019-2020 rate of \$4,895 for 6+ hours/semester. For each year, the anticipated number of students enrolled in the program during the fall and spring, respectively, is multiplied by \$4,895 to obtain the total tuition per year. For example, we anticipate that 15 students will be enrolled in the program during the first year. Therefore, for Year 1, the total tuition amount is  $15 \times \$4,895$  (fall) +  $15 \times \$4,895$  (spring) = \$149,550. Similarly, we calculate the tuition amounts for years 2 to 4 using the respective anticipated enrollment numbers of 35, 45 and 55 students; see calculations in the table below.

iii. Explain the nature of any student fees listed (course fees, lab fees, program fees, etc.). Exclude student mandatory fees (e.g., activity, health, athletic, etc.).

Program fees will cover the cost of student housing while resident at Skidaway Institute for the study away Coastal Semester that will be administered through the Office of Global Engagement. Housing cost is estimated at \$2,760 for the semester for each student (which is approximately \$23/day) and includes a shared kitchen and living space, and single or double occupancy rooms with private or shared bath (multiplied by 15, 20, 25 and 30 students total for the first four years). Scholarship funding may be available to students through the experiential learning program, and students taking on research projects at the coast can apply for CURO or Honors funding to help offset this cost.

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Lab fees for \$130 per student (15, 20, 25 and 30 students total for the first four years) will cover expendable supplies for the capstone semester course, MARS 4500 Field Methods, taken at Skidaway Institute in the fall semester of the students' senior year.

- iv. If revenues from Other Grants are included, please identify each grant and indicate if it has been awarded.

At present, no direct grant support is available, e.g., in the form of an NSF or foundation grant. However, as described above, Skidaway Institute was awarded an enhancement to their base B-budget in FY2019 to provide 5 ship days on the research vessel Savannah for UGA undergraduate experiential learning opportunities across all academic units. These ship days will be available to the new undergraduate major on a competitive basis when appropriate courses that need the resource are offered. Each year we plan to submit a proposal requesting at least 2 of those experiential learning ship-days so that students get to experience an overnight trip at sea while making oceanographic measurements around the clock to understand tidal and diel variations. The ship can accommodate 16 science personnel with 6 crew members.

- v. If Other Revenue is included, identify the source(s) of this revenue and the amount of each source.

N/A

- i.) Revenue Calculation: Provide the revenue calculation, in other words, the actual calculation used to determine the projected tuition revenue amounts for each fiscal year involving start-up and implementation of the proposed program.

Revenue is a sum of the new tuition (calculated as described in Section 23.h.ii above), program fees and lab fees (calculated as described in Section 23.h.iii above). There are no recurring/permanent or one-time funds.

- j.) When Grand Total Revenue is not equal to Grand Total Costs:

- i. Explain how the institution will make up the shortfall. If reallocated funds are the primary tools being used to cover deficits, what is the plan to reduce the need for the program to rely on these funds to sustain the program?

There is no shortfall since funds needed to get started are available from the Department of Marine Sciences, Skidaway Institute, and Franklin College, and there is a projected surplus estimated for all years.

- ii. If the projected enrollment is not realized, provide an explanation for how the institution will cover the shortfall.

If the enrollments match the projections in the first year, there will not be a shortfall because the cost to get the program up and running is less than the anticipated revenue. In subsequent years, no shortfall will exist because the program is designed to run without any increase in cost to the University. If projected enrollments are not realized in the first year, then a shortfall could exist and Franklin College will cover this cost in order to help get the program going; in subsequent years there will be an expected surplus that will offset the shortfall in the first year. Existing courses will continue to be taught as part of the Area of Emphasis in Marine Biology and as part

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of the Interdisciplinary Studies major available through Franklin College of Arts and Sciences

- iii.* If the projected enrollment is not realized, what are your next action steps in terms of bolstering the program, potentially altering the program, teach-outs, a planned phase-out, etc.?

If the projected enrollment is not realized, then altering the program to meet the needs of the student will be considered. The degree program is already designed to be flexible in that a student can vary the amount of life sciences, physical sciences and engineering, and natural resources and conservation in their third- and fourth-year curriculum in order to satisfy their career interests. We recognize that Ocean Science is a multi- and inter-disciplinary science, and we expect students to have varying interest and focus areas. Annual assessments will provide valuable information on how the program can be altered in order to attract more student interest or whether new areas of instruction will need to be developed.

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<b>I. EXPENDITURES</b>	First FY21 Dollars	Second FY22 Dollars	Third FY23 Dollars	Fourth FY24 Dollars
<b>Personnel – reassigned or existing positions</b>				
Faculty (see 17.c.ii)	\$57,225	\$58,370	\$59,537	\$60,728
Part-time Faculty (see 17.c.ii)				
Graduate Assistants (see17.c.ii)				
Administrators(see17.c.ii)		\$9,000	\$9,000	\$9,000
Support Staff (see17.c.ii)				
Fringe Benefits	\$18,884	\$22,232	\$22,617	\$23,010
Other Personnel Costs				
<b>Total Existing Personnel Costs</b>	\$76,110	\$89,602	\$91,155	\$92,738
<b>EXPENDITURES (Continued)</b>				
<b>Personnel – new positions (see17.c.i)</b>				
Faculty				
Part-time Faculty				
Graduate Assistants				
Administrators				
Support Staff				
Fringe Benefits				
Other personnel costs				
<b>Total New Personnel Costs</b>	\$0	\$0	\$0	\$0
<b>Start-up Costs (one-time expenses) (see17.c.i)</b>				
Library/learning resources				
Equipment Skidaway Institute teaching lab and field equipment; see Appendix I for details (\$25,000 SkIO; \$15,000 MARS; \$43,000 FCAS – see letter of support in Appendix I)	\$83,000	\$0	\$0	\$0
Other				
Physical Facilities: construction or renovation (see section on Facilities)				
<b>Total One-time Costs</b>	\$83,000	\$0	\$0	\$0
<b>Operating Costs (recurring costs – base budget) (see17.c.i)</b>				
Supplies/Expenses				
Travel				
Equipment				
Library/learning resources				
Other	\$0	\$0	\$0	\$0

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<b>Total Recurring Costs</b>	\$0	\$0	\$0	\$0
<b>GRAND TOTAL COSTS</b>	\$159,110	\$89,602	\$91,155	\$92,738

<b>III. REVENUE SOURCES</b>				
<b>Source of Funds</b>				
Reallocation of existing funds (see 23.h.i)				
New student workload				
New Tuition (see 23.h.ii)	\$146,850	\$342,650	\$440,550	\$538,450
Federal funds				
Other grants (see 23.h.iv)				
Student fees (see 23.h.iii)      program fees	\$41,400	\$55,200	\$69,000	\$82,800
Exclude mandatory fees      lab fees (i.e., activity, health, athletic, etc.).	\$1,950	\$2,600	\$3,250	\$3,900
Other (see 23.h.v)				
New state allocation requested for budget hearing				
<b>GRAND TOTAL REVENUES</b>	\$190,200	\$400,450	\$512,800	\$625,150
<b>Nature of Revenues</b>				
Recurring/Permanent Funds				
One-time funds				
<b>Projected Surplus/Deficit</b> (Grand Total Revenue – Grand Total Costs) (see 20.h.i. & 20.h.ii).	\$31,090	\$310,848	\$421,645	\$532,412

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**25.) Facilities/Space Utilization for New Academic Program Information**

Facilities Information — Please Complete the table below.

<b>Marine Sciences Building, <i>on campus</i></b>		<b>Total GSF</b>
<b>a.</b>	<b>Indicate the floor area required for the program in gross square feet (gsf). When addressing space needs, please take into account the projected enrollment growth in the program over the next 10 years.</b>	Teaching lab 3400 gsf Classroom 2250 gsf
<b>b.</b>	<b>Indicate if the new program will require new space or use existing space. (Place an "x" beside the appropriate selection.)</b>	
	<b>Type of Space Existing space</b>	<b>Comments</b>
i.	Construction of new space is required (x).-→ No	
ii.	Existing space will require modification (x). → No	
iii.	If new construction or renovation of existing space is anticipated, provide the justification for the need.	No
iv.	Are there any accreditation standards or guidelines that will impact facilities/space needs in the future? If so, please describe the projected impact.	No
v.	Will this program cause any impact on the campus infrastructure, such as parking, power, HVAC, other? If yes, indicate the nature of the impact, estimated cost, and source of funding.	No
vi.	Indicate whether existing space will be used. X	Existing space is already being used for classroom and laboratory instruction
<b>c.</b>	<b>If new space is anticipated, provide information in the spaces below for each category listed:</b>	
i.	Provide the estimated construction cost.	N/A
ii.	Provide the estimated total project budget cost.	N/A
iii.	Specify the proposed funding source.	N/A
iv.	What is the availability of funds?	N/A
v.	When will the construction be completed and ready for occupancy? (Indicate semester and year).	N/A
vi.	How will the construction be funded for the new space/facility?	N/A
vii.	Indicate the status of the Project Concept Proposal submitted for consideration of project authorization to the Office of Facilities at the BOR. Has the project been authorized by the BOR or appropriate approving authority?	N/A

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<b>d. If existing space will be used, provide information in the space below.</b>				
Provide the building name(s) and floor(s) that will house or support the program. Indicate the campus, if this is part of a multi-campus institution and not physically located on the main campus. Please do not simply list all possible space that could be used for the program. We are interested in the actual space that will be used for the program and its availability for use.				
Marine Sciences Building on campus has classroom space on the second floor in rooms 239, 208, and 261. The teaching laboratory is on the first floor and includes rooms 139, 139A, 139B, 139C, 132C				
<b>e. List the specific type(s) and number of spaces that will be utilized (e.g. classrooms, labs, offices, etc.)</b>				
<b>i.</b>	<b>No. of Spaces</b>	<b>Type of Space</b>	<b>Number of Seats</b>	<b>Assignable Square Feet (ASF)</b>
	2	Classrooms	Rm 239 - 45; Rm 208 - 12;	1207 252
	1	Labs (dry)	Rm 139 - 20 Rm 132C-20 Rm 139A-20	1916 439 539
	2	Labs (wet)	Rm 139B, 139C - 10	241 238
	1	Meeting/Seminar Rooms	Rm 261 -20	791
	2	Offices	Student Affairs Specialist III – Rm 206 Undergraduate Coordinator – 290A	123 136
		Other (specify)		
	<b>Total Assignable Square Feet (ASF)</b>			
<b>ii. If the program will be housed at a temporary location, please provide the information above for both the temporary space and the permanent space. Include a time frame for having the program in its permanent location.</b>				
N/A				
<b>Chief Business Officer or Chief Facilities Officer Name &amp; Title</b>		<b>Phone No.</b>	<b>Email Address</b>	
		<b>Signature</b>		
<b>Note: A Program Manager from the Office of Facilities at the System Office may contact you with further questions separate from the review of the new academic program.</b>				

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<b>Skidaway Institute of Oceanography, off campus</b>		<b>Total GSF</b>
<b>a.</b>	<b>Indicate the floor area required for the program in gross square feet (gsf). When addressing space needs, please take into account the projected enrollment growth in the program over the next 10 years.</b>	<b>5500</b>
<b>b.</b>	<b>Indicate if the new program will require new space or use existing space. (Place an "x" beside the appropriate selection.)</b>	
	<b>Type of Space</b>	<b>Comments</b>
i.	Construction of new space is required (x). -> No	
ii.	Existing space will require modification (x). -> No	
iii.	If new construction or renovation of existing space is anticipated, provide the justification for the need.	No
iv.	Are there any accreditation standards or guidelines that will impact facilities/space needs in the future? If so, please describe the projected impact.	No
v.	Will this program cause any impact on the campus infrastructure, such as parking, power, HVAC, other? If yes, indicate the nature of the impact, estimated cost, and source of funding.	No
vi.	Indicate whether existing space will be used. Yes	
<b>c. If new space is anticipated, provide information in the spaces below for each category listed:</b>		
i.	Provide the estimated construction cost.	0
ii.	Provide the estimated total project budget cost.	0
iii.	Specify the proposed funding source.	0
iv.	What is the availability of funds?	0
v.	When will the construction be completed and ready for occupancy? (Indicate semester and year).	0
vi.	How will the construction be funded for the new space/facility?	0
vii.	Indicate the status of the Project Concept Proposal submitted for consideration of project authorization to the Office of Facilities at the BOR. Has the project been authorized by the BOR or appropriate approving authority?	0
<b>d. If existing space will be used, provide information in the space below.</b>		
Provide the building name(s) and floor(s) that will house or support the program. Indicate the campus, if this is part of a multi-campus institution and not physically located on the main campus. Please do not simply list all possible space that could be used for the program. We are interested in the actual space that will be used for the program and its availability for use.		

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<p>Skidaway Institute is currently renovating its historic cattle barn to support teaching activities in the Coastal Semester at Skidaway segment of the undergraduate program. The renovations will be completed by summer 2019, well before students would be ready to be in residence. Facilities will include two classrooms, a teaching lab with support room, offices and collaborative spaces. The Institute has invested \$200,000 above the funds allocated by the Legislature to make sure the facilities meet the needs of the new undergraduate major.</p>				
<b>e. List the specific type(s) and number of spaces that will be utilized (e.g. classrooms, labs, offices, etc.)</b>				
i.	<b>No. of Spaces</b>	<b>Type of Space</b>	<b>Number of Seats</b>	<b>Assignable Square Feet (ASF)</b>
	2	Classrooms	Room A - 24 Room B - 24	611 610
	1	Labs (dry)	Lab A	1003
		Labs (wet)		
	3	Meeting/Seminar Rooms	MSCRIC Library Conf Library Aud.	560 400 1020
	2	Offices		Office A – 146 Office B – 146
		Other (specify)		
<b>Total Assignable Square Feet (ASF)</b>				<b>6085</b>
<b>ii. If the program will be housed at a temporary location, please provide the information above for both the temporary space and the permanent space. Include a time frame for having the program in its permanent location.</b>				
N/A				
<b>Chief Business Officer or Chief Facilities Officer Name &amp; Title</b>		<b>Phone No.</b>	<b>Email Address</b>	
		<b>Signature</b>		
<p><b>Note: A Program Manager from the Office of Facilities at the System Office may contact you with further questions separate from the review of the new academic program.</b></p>				

**FINAL NOTE:**

Appendices that do not apply to the proposed program should not be attached.

## **APPENDIX I**

Use this section to include letters of support, curriculum course descriptions, and recent rulings by accrediting bodies attesting to degree level changes for specific disciplines, and other information.

References

Course Descriptions

Laboratory and Field Teaching Equipment Budget for Skidaway Institute

Letters of Support from UGA academic units

Commitment of Funds for the Bachelor of Science in Ocean Science

Letters of Support from agencies

## References

1. Dynamic Earth: GEO Imperatives & Frontiers 2015–2020. NSF Advisory Committee for Geosciences. December 2014. [https://www.nsf.gov/geo/acgeo/geovision/nsf\\_acgeo\\_dynamic-earth-2015-20.pdf](https://www.nsf.gov/geo/acgeo/geovision/nsf_acgeo_dynamic-earth-2015-20.pdf)
2. Strategic Frameworks for Education & Diversity, Facilities, International Activities, and Data & Informatics in the Geosciences. . NSF Advisory Committee for Geosciences. April 2012. [https://www.nsf.gov/geo/acgeo/geovision/geo\\_strategic\\_plans\\_2012.pdf](https://www.nsf.gov/geo/acgeo/geovision/geo_strategic_plans_2012.pdf)
3. Geo Vision Report: Unraveling Earth’s Complexities through the Geosciences. NSF Advisory Committee for GeoSciences. October 2009. [http://www.nsf.gov/geo/acgeo/geovision/nsf\\_acgeo\\_vision\\_10\\_2009.pdf](http://www.nsf.gov/geo/acgeo/geovision/nsf_acgeo_vision_10_2009.pdf)
4. The Geosciences Workforce: Questions and Challenges. UCAR presentation by Tim Killeen, Assistant Director for Geosciences, National Science Foundation. 17 October 2008. [http://www.ucar.edu/governance/meetings/oct08/followup/head\\_and\\_chairs/tim\\_killeen.pdf](http://www.ucar.edu/governance/meetings/oct08/followup/head_and_chairs/tim_killeen.pdf)

## Course Descriptions

### New Proposed Courses:

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<b>Course ID:</b>	<b>MARS 3200.</b> 3 hours.
<b>Course Title:</b>	<b>Fundamentals of Ocean Science</b>
<b>Course Description:</b>	An introduction to Ocean Science, emphasizing the interdisciplinary nature of the field, and using core concepts from biology, chemistry, physics, and geology to explore coastal and oceanic systems.
<b>Athena Title:</b>	Fund Ocean Sci
<b>Prerequisite:</b>	CHEM 1211 or (PHYS 1111 or PHYS 1211) or BIOL 1107
<b>Semester Course Offered:</b>	Offered fall semester every year.
<b>Grading System:</b>	A-F (Traditional)

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<b>Course ID:</b>	<b>MARS 4400.</b> 3 hours.
<b>Course Title:</b>	<b>Introduction to Marine Policy</b>
<b>Course Description:</b>	This class is designed to introduce students to the major environmental laws and issues that affect the oceans and coasts and to develop an interdisciplinary understanding of the legal, scientific, and societal perspectives that influence marine policy.
<b>Athena Title:</b>	Intro Marine Policy
<b>Prerequisite:</b>	MARS 3410
<b>Semester Course Offered:</b>	Offered spring semester every year.
<b>Grading System:</b>	A-F (Traditional)

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<b>Course ID:</b>	<b>MARS 4520.</b> 3 hours.
<b>Course Title:</b>	<b>Quantitative Analysis of Ocean Data</b>
<b>Course Description:</b>	An introduction to common quantitative tools used by ocean scientists to analyze data. Topics will include fundamentals of statistics, time series techniques, mass balance calculations, and simple models. The course will emphasize practical approaches to analysis of many types of data and will rely heavily on computer analysis and visualization of data sets.
<b>Athena Title:</b>	Quant Anal Ocean Data
<b>Prerequisite:</b>	MARS 4100, 4200
<b>Semester Course Offered:</b>	Offered fall semester every year.
<b>Grading System:</b>	A-F (Traditional)

## Existing Courses:

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<b>Course ID:</b>	<b>MARS 3450.</b> 3 hours.
<b>Course Title:</b>	<b>Marine Biology</b>
<b>Course Description:</b>	Study of marine organisms and the environments they inhabit; diversity of marine organisms, primary and secondary production in marine habitats, ecological interactions in marine environments, and management concerns.
<b>Athena Title:</b>	MARINE BIOLOGY
<b>Prerequisite:</b>	[(BIOL 1108 and BIOL 1108L) or (BIOL 2108H and BIOL 2108L)] and [(CHEM 1212 and CHEM 1212L) or (CHEM 1312H and CHEM 1312L)]
<b>Semester Course Offered:</b>	Offered fall and spring semester every year.
<b>Grading System:</b>	A-F (Traditional)

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<b>Course ID:</b>	<b>MARS 3550.</b> 3 hours.
<b>Course Title:</b>	<b>Life in Fluids</b>
<b>Course Description:</b>	A non-calculus-based introduction to the interactions between organisms and their environment and how those interactions affect an organism's structure and function. The properties and dynamics of fluids will be developed intuitively from an organismal point of view, emphasizing bio-physical interactions and organism adaptations.
<b>Athena Title:</b>	LIFE IN FLUIDS
<b>Prerequisite:</b>	(BIOL 1108 and BIOL 1108L) or BIOL 2108H
<b>Semester Course Offered:</b>	Offered spring semester every odd-numbered year.
<b>Grading System:</b>	A-F (Traditional)

---

<b>Course ID:</b>	<b>MARS 4100/6100.</b> 3 hours.
<b>Course Title:</b>	<b>Geological and Physical Oceanography</b>
<b>Course Description:</b>	Oceanographic principles of the geological and physical structure, composition, and processes of the ocean with emphasis on general oceanic circulation, water properties, waves and tides, coastal physical processes, turbulent mixing, sediment transport.
<b>Athena Title:</b>	PHYS PROCESS OCEAN
<b>Prerequisite:</b>	PHYS 1112-1112L or PHYS 1212-1212L
<b>Semester Course Offered:</b>	Offered spring semester every odd-numbered year.
<b>Grading System:</b>	A-F (Traditional)

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<b>Course ID:</b>	<b>ENGR(MARS) 4113/6113-4113L/6113L.</b> 4 hours. 3 hours lecture and 3 hours lab per week.
<b>Course Title:</b>	<b>Introductory Geophysical Fluid Dynamics with Applications</b>
<b>Course Description:</b>	Second semester fluid dynamics course for graduate students and advanced undergraduates emphasizing quasi-geostrophic dynamics, balance models, Rossby, Kelvin and gravity waves, barotropic, baroclinic, inertial and convective instabilities, and the general circulation of rotating stratified fluids. Applications

made to weather forecasting and ocean dynamics. Laboratory includes hands-on experiments and simulations.

**Athena Title:** INTRO GEO FL DYN  
**Prerequisite:** MATH 2500 and MATH 2700 and (PHYS 1212-1212L or PHYS 1312-1312L) and [GEOG(ENGR) 4112/6112 or MARS 4100/6100]  
**Semester Course Offered:** Offered every odd-numbered year.  
**Grading System:** A-F (Traditional)

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**Course ID:** ENVE(MARS) 4175/6175. 3 hours.  
**Course Title:** Coastal Meteorology  
**Course Description:** An introduction to air-sea-land interactions that occur at the boundaries of continents. The course will cover atmospheric radiation, thermodynamics, and hydrodynamics, mesoscale and synoptic scale weather systems, atmospheric boundary layers, and applications to engineering meteorology.  
**Athena Title:** Coastal Meteorology  
**Prerequisite:** MATH 2500 and (PHYS 1212-1212L or PHYS 1312-1312L)  
**Pre or Corequisite:** MATH 2700  
**Semester Course Offered:** Not offered on a regular basis.  
**Grading System:** A-F (Traditional)

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**Course ID:** MARS 4200/6200. 3 hours.  
**Course Title:** Chemical and Biological Oceanography  
**Course Description:** Chemical composition, dynamics, and processes of life in the oceans and the role the life of the oceans plays in global processes.  
**Athena Title:** CHEM BIOL OCEAN  
**Duplicate Credit:** Not open to students with credit in MARS 4110/6110  
**Prerequisite:** [(BIOL 1108 and BIOL 1108L) or BIOL 2108H] and CHEM 1211 and CHEM 2211  
**Semester Course Offered:** Offered fall semester every year.  
**Grading System:** A-F (Traditional)

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**Course ID:** MARS(FISH) 4380/6380-4380L/6380L. 3 hours. 2 hours lecture and 2 hours lab per week.  
**Course Title:** Marine Fisheries Biology  
**Course Description:** Interaction of oceanographic processes with the life histories and productivity of marine fisheries species, and the human interactions with major marine fisheries.  
**Athena Title:** MAR FISHERIES BIOL  
**Duplicate Credit:** Not open to students with credit in FORS 4380/6380-4380L/6380L  
**Prerequisite:** BIOL 1108-1108L and permission of department  
**Semester Course Offered:** Offered spring semester every year.  
**Grading System:** A-F (Traditional)

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**Course ID:** MARS 4500/6500. 3-5 hours. 9-15 hours lecture and 15-25 hours lab per week.  
**Course Title:** Field Study in Oceanography and Marine Methods  
**Course Description:** Laboratory and fieldwork in chemical, biological, sedimentological, and physical oceanographic processes and methods in southeast estuarine, coastal, and shelf environments.  
**Athena Title:** Field Study in Oceanography  
**Nontraditional Format:** A field study course taught off-campus.  
**Prerequisite:** Permission of department  
**Semester Course Offered:** Offered summer semester every year.  
**Grading System:** A-F (Traditional)

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**Course ID:** MARS 4510/6510. 3-7 hours. Repeatable for maximum 7 hours credit. 40 hours lab per week.  
**Course Title:** Field Study in Oceanography and Marine Methods: Independent Research  
**Course Description:** Independent field research on oceanographic processes.  
**Athena Title:** FIELD OCEAN INDEP  
**Nontraditional Format:** A field study course taught off-campus.  
**Prerequisite:** Permission of department  
**Semester Course Offered:** Offered fall, spring and summer semester every year.  
**Grading System:** A-F (Traditional)

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**Course ID:** MARS(MIBO) 4620/6620-4620L/6620L. 3 hours. 2 hours lecture and 2 hours lab per week.  
**Course Title:** Microbial Ecology  
**Course Description:** Emphasizes the roles of microorganisms in ecosystems. Nutrient cycles, methods of microbial analysis, and the functional roles of microorganisms.  
**Athena Title:** Microbial Ecology  
**Undergraduate Pre or Corequisite:** MIBO 3500 or MIBO 3500E or permission of department  
**Graduate Pre or Corequisite:** MIBO 3500 or MIBO 3500E or permission of department  
**Semester Course Offered:** Offered fall semester every odd-numbered year.  
**Grading System:** A-F (Traditional)

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**Course ID:** MATH(MARS) 4730/6730. 3 hours.  
**Course Title:** Mathematics of Climate  
**Course Description:** Basic mathematical models describing the physical, chemical, and biological interactions that affect climate. Mathematical and computational tools for analyzing these models.  
**Athena Title:** Mathematics of Climate  
**Prerequisite:** MATH 2700  
**Semester Course Offered:** Offered every year.  
**Grading System:** A-F (Traditional)

---

**Course ID:** MARS 4810/6810. 3 hours.  
**Course Title:** Global Biogeochemical Cycles  
**Course Description:** An overview of global biogeochemical cycles, with emphasis on the role of the ocean, including box models and both fundamental principles and quantitative analyses. Focus is on modern day conditions, but glacial-interglacial changes and effects of global change are included.  
**Athena Title:** GLOBAL BGC CYCLES  
**Prerequisite:** Permission of department  
**Semester Course Offered:** Offered spring semester every even-numbered year.  
**Grading System:** A-F (Traditional)

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**Course ID:** MARS 4960. 3-12 hours. Repeatable for maximum 12 hours credit. 6-24 hours lab per week.  
**Course Title:** Undergraduate Research  
**Course Description:** Research project directed by a faculty member independent of scheduled classes.  
**Athena Title:** UNDERGRAD RESEARCH  
**Prerequisite:** Permission of department  
**Semester Course Offered:** Offered fall, spring and summer semester every year.  
**Grading System:** A-F (Traditional)

**Laboratory & Field Teaching Equipment Budget for Skidaway Institute**

	Item	Number	Unit Cost	Total
Lab Equipment	Fluorometer	1	\$10,000	\$10,000
	Spectrophotometer	1	\$10,000	\$10,000
	Handheld sondes	3	\$3,000	\$9,000
	Turbidity meter	1	\$1,000	\$1,000
	Binocular microscopes	4	\$1,500	\$6,000
	Dissecting microscopes	4	\$1,500	\$6,000
	Camera for microscope	1	\$1,000	\$1,000
	Computer for scope	1	\$1,000	\$1,000
	Pan balance	1	\$1,500	\$1,500
	Analytical balance	1	\$3,000	\$3,000
	Stirring hot plates	4	\$500	\$2,000
	Filtration equipment	4	\$1,150	\$4,600
	Drying oven	1	\$2,000	\$2,000
	Refrigerator	1	\$1,000	\$1,000
	Freezer	1	\$1,500	\$1,500
	Vortex	1	\$100	\$100
	Microcentrifuge	1	\$1,000	\$1,000
	Sieve shaker	1	\$2,200	\$2,200
	Geology sieves	9	\$75	\$675
	Biology sieves	6	\$75	\$450
	Pipetters	4	\$300	\$1,200
	Misc glassware	1	\$2,500	\$2,500
Field Equipment	Castaway CTD	1	\$8,000	\$8,000
	Handheld GPS	3	\$200	\$600
	Secchi disk	1	\$40	\$40
	Plankton net(s)	2	\$150	\$300
	Sampling bottles	30	\$50	\$1,500
	BOD bottles	24	\$50	\$1,200
	Niskin bottles	3	\$700	\$2,100
	Bottom grab	1	\$900	\$900
	Buckets	24	\$10	\$240
	Core barrels	12	\$10	\$120
	Core sectioning stand	1	\$75	\$75
	Coolers	2	\$100	\$200
	<b>TOTAL ONE-TIME COSTS</b>			



UNIVERSITY OF  
**GEORGIA**

Franklin College of Arts and Sciences  
*Department of Marine Sciences*

Marine Sciences Building  
325 Sanford Dr.  
Athens, Georgia 30602  
TEL 706-542-2820 | FAX 706-542-5888  
marscihd@uga.edu  
<http://marsci.uga.edu/>

March 5, 2019

Dr. Jean Martin-Williams  
Associate Dean  
Franklin College of Arts and Sciences

Dear Dr. Martin-Williams,

I am pleased to present the attached proposal for a Bachelor of Science major in Ocean Science, administered by the Department of Marine Sciences residing in the Franklin College of Arts and Sciences. This proposal was approved by a vote of 19 Yes, 0 No, 3 Abstentions. A quorum was present for this vote with 22/25 of the eligible faculty casting their vote.

**History.** The Department of Marine Sciences was established 25 years ago, in 1992. However there is a long tradition of marine research in Georgia reaching back to the early 1950s, when the UGA Marine Institute (UGAMI) was established on Sapelo Island as a premier center for the study of salt marsh ecosystems, and in 1967 when the Skidaway Institute of Oceanography (SkIO) located on Skidaway Island near Savannah GA was established to conduct research in all fields of oceanography and to serve as a gateway to coastal and marine environments for programs throughout the University System. In 2013, SkIO was merged with the University of Georgia and the faculty became part of the Department of Marine Sciences. The need to fully integrate recently added Skidaway Institute of Oceanography faculty into the instructional mission of UGA makes this a unique window of opportunity to start the UGA BS in Ocean Science without hiring new faculty, while in return, Skidaway Institute offers unique learning opportunities for UGA students. The mission of the Department of Marine Sciences is *to be an international leader in advancing the frontiers of ocean science research, educating students and the public about the function and importance of ocean ecosystems, and fostering stewardship of coastal and oceanic resources.*

**Rationale.** UGA is Georgia's Sea Grant College with some of the finest coastal facilities in the Southeast, internationally recognized faculty in Ocean Science, and existing classroom and laboratory space. As outlined below and described in greater detail in the One Step Academic Program Proposal, the BS in Ocean Science at UGA would meet critical state and national needs and address UGA's strategic goals. The UGA BS in Ocean Science could be launched using existing infrastructure, administration, and, most importantly, faculty. There is a demand for a BS in Ocean Science from UGA students currently in other majors and from students who attend Ocean Science programs at universities outside of Georgia. Because it would draw from a different prospective student pool, the UGA BS in Ocean Science would not have a negative impact on the Marine Sciences BS program at Savannah State University, the only marine sciences bachelor's degree program currently in Georgia, and could lead to more meaningful collaboration between our institutions.

**The UGA BS degree in Ocean Science would meet critical state and national needs.** Georgia and the US face a growing number of complex and urgent environmental challenges that will require training in STEM to meet. Predictions from the National Science Foundation cite the Geosciences (ocean science's parent discipline) as an area where current supply will not meet future demand. Jobs for employees trained in marine and environment-related areas of STEM are predicted to increase faster than the national average in the next 10 years (for more detail see section 6 Need).

**The UGA BS degree in Ocean Science would address UGA strategic goals and grand challenges.** The proposed program will contribute directly to two of the core strategic directions in UGA's 2020 Strategic Plan: "Building on Excellence in Undergraduate Education," and "Improving Stewardship of Natural

Resources.” The faculty teaching in the UGA BS in Ocean Science work in areas closely related to UGA’s Signature Research Theme of “Safeguarding and Sustaining our World.”

**The UGA BS degree in Ocean Science would build on previous state and BOR investments and require few additional resources.** The UGA BS in Ocean Science would require no new facilities, administrative personnel, or faculty. With the recent merger of the Athens and Skidaway campuses, the Marine Sciences Department now has 25 faculty active in research and instruction with a strong desire to train undergraduate students in Ocean Science. The recent addition of faculty at the Skidaway campus makes this a unique window of opportunity allowing the teaching needs for the UGA BS in Ocean Science, and current graduate and service instructional needs to be met without adding new faculty. The UGA Marine Sciences Department has appropriate instructional space on the Athens campus and improvements are underway at the Skidaway campus to make instructional space available. The only new resource requested is \$83,000 for one time purchase of equipment and supplies for a newly built teaching laboratory at SkIO (for more detail see section 23.g.i in Fiscal, Tuition and Estimated Budget).

**There is unmet student demand for a UGA BS degree in Ocean Science.** Neighboring states (AL, FL, NC, and SC) have 3 - 12 degree programs in Marine Sciences or related fields that awarded an average of 175 B.S. degrees in the 2016-17 academic year. Georgia has one program that awarded 12 degrees. Since it was first offered two years ago by the UGA Marine Science Department, a Marine Biology area of interest has attracted 46 UGA Biology majors. Based on surveys of UGA students taking Marine Science courses, potential enrollment in the proposed major is 20/year. In the last two years, 130 students have expressed interest in a UGA Ocean Science BS online or in person, with several indicating that they will go to neighboring states to pursue a degree in Ocean Science or a related discipline (for more detail see sections 7 Demand and 23 Enrollment Projections).

**The proposed UGA BS does not conflict with the existing program at SSU.** The only BS program in marine sciences in Georgia is at Savannah State University, an institution with an enrollment of 4,900, a long and rich history of nurturing students, and a stated vision of becoming a regional institution of choice (<https://www.savannahstate.edu/president/index.shtml>). As described in the “Unmet student demand” section above, the students likely to enroll in the UGA Ocean Science major will come from a pool of students who are currently choosing to go to institutions in other states or who are at UGA in other majors. Historically, there has been a long-standing collaborative relationship between faculty at Skidaway and faculty at SSU in areas of undergraduate and graduate research and instruction. There is great potential for the Marine Sciences program at SSU and the Ocean Science program at UGA to benefit each other through co-teaching of courses and complementary research programs, particularly given the proximity of the Skidaway Institute to the SSU campus.

**Summary.** This proposal represents a thoughtful development of a BS in Ocean Science that will offer UGA students a pathway to understanding the physical, chemical, biological and geological aspects of our oceans and does not require additional staffing to implement. Our curriculum includes Skidaway Institute which is an internationally recognized research facility at the coast, and is equivalent to a BS major offered at peer and aspirational institutions across the nation.

If you have any questions about this proposal please don’t hesitate to contact me at [daniela@uga.edu](mailto:daniela@uga.edu) or (706) 542 2820.

Sincerely,



Daniela Di Iorio  
Professor and Department Head

cc. Dr. Alan T Dorsey, Dean Franklin College of Arts and Sciences



February 25, 2019

Dr. Libby Morris  
Interim, Senior Vice President for Academic Affairs and Provost  
University of Georgia  
203 Administration Building  
Athens GA 30602

Dear Provost Morris,

We are writing this letter in support of the proposed Bachelor of Science undergraduate major in Ocean Science at the University of Georgia administered by the Department of Marine Sciences in Franklin College. This proposed academic program is a timely submission given the dramatic changes that our oceans and coastal environments are facing. With these intensifying environmental pressures comes the concomitant need for college graduates with an interdisciplinary understanding of the structure and function of ocean systems and the critical thinking skills and analytical tools to design, carry out, and interpret scientific studies and data in a broad range of environmental fields.

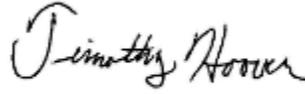
The University of Georgia is in a strong position to develop an outstanding undergraduate program in Ocean Science. In addition to its world class faculty, it has some of the finest coastal facilities in the Southeast, including the Skidaway Institute of Oceanography (SkIO) and the UGA Marine Institute on Sapelo Island (UGAMI). The proposed program would leverage faculty and facilities at these Institutes to provide exceptional experiential learning opportunities for UGA students.

The interdisciplinary nature of the proposed program has the potential to expand educational and research opportunities for students at UGA and undergraduates across the State and beyond. The tremendous diversity of faculty expertise and instructional opportunities at UGA greatly enhances the prospects for such a program, and given its flexibility it can incorporate courses from other units across campus. In this context we welcome Ocean Science undergraduates into courses taught by faculty in our respective units.

Sincerely,



Lisa Donovan  
Distinguished Research Professor and  
Department Head, Plant Biology



Timothy Hoover  
Professor and Department Head,  
Microbiology



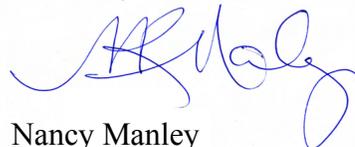
Christopher West  
Professor and Department Head,  
Biochemistry and Molecular Biology



Kristen Miller  
Director of Biological Sciences



John Gittleman  
UGA Foundation Professor in Ecology  
Dean, Odum School of Ecology



Nancy Manley  
Distinguished Research Professor  
Department Head, Genetics



Marshall Shepherd  
Georgia Athletic Association Distinguished Professor  
Director, UGA Atmospheric Sciences Program



Robert Bringolf  
Associate Dean for Academic Affairs and Professor  
Warnell School of Forestry and Natural Resources



Ramaraja P. Ramasamy  
Associate Dean for Academic Affairs and Associate Professor  
College of Engineering



UNIVERSITY OF  
**GEORGIA**

Old College  
Athens, Georgia 30602  
TEL 706-542-3400  
www.franklin.uga.edu

Franklin College of Arts and Sciences  
*Office of the Dean*

To: Daniela Di Iorio, Department Head, Marine Sciences  
Clark Alexander, Director, Skidaway Institute of Oceanography  
From: Alan Dorsey, Dean, Franklin College  
Michelle Momany, Associate Dean, Franklin College  
Re: FCAS contribution for Ocean Science Undergraduate Major  
Date: Feb. 19, 2019

Dear Daniela and Clark,

Franklin College will contribute to the start-up costs for the proposed UGA Ocean Science major on the following schedule: \$25,000 in FY20 and \$18,000 in FY21. This will be added to your units' FY21 contributions of \$15,000 (MARS) and \$ 25,000 (SkIO) to cover the estimated \$83,000 required for equipment and supplies. We are very excited about the proposed Bachelor of Science major in Ocean Science. It promises to make great contributions both to UGA and the state.

Sincerely,

Alan T. Dorsey  
Dean

Michelle Momany  
Associate Dean



DEPARTMENT OF NATURAL RESOURCES  
COASTAL RESOURCES DIVISION  
ONE CONSERVATION WAY • BRUNSWICK, GA 31520 • 912.264.7218  
COASTALGADNR.ORG

MARK WILLIAMS  
COMMISSIONER

DOUG HAYMANS  
DIRECTOR

February 13, 2019

Board of Regents of the University System of Georgia  
270 Washington Street, SW  
Atlanta, GA 30334

**RE: Bachelor of Science in Ocean Science  
Letter of Support**

On behalf of the GA Department of Natural Resources' Coastal Resources Division, I would like to convey our support in the development of a Bachelor of Science in Ocean Science program. Students and graduates from such a program would assist in the development of expertise and insight that would serve our agency in the management of our coastal resources.

The Coastal Resources Division's (CRD) primary responsibility is the management Georgia's marshes, beaches, and marine fishery resources. Based in Brunswick, CRD administers permitting programs under the Coastal Marshlands Protection Act and Shore Protection Act; issues revocable licenses for use of state-owned water bottoms; monitors coastal water quality; and manages shellfish harvest areas. CRD conducts research; management and development activities associated with recreational and commercial fishery resources; represents Georgia on regional marine fishery boards and commissions; and builds boat ramps, artificial reefs, and fishing piers.

We have a wide range of jobs that require the type of educational training that a Bachelor of Science in Ocean Science program would provide. Examples of such jobs range from marine biologists conducting fishery management surveys, to permit coordinators evaluating applications for coastal development projects, to coastal resource specialists working with local governments on beach management programs. These jobs require well-educated folks that have the knowledge needed to insure our public resources on the coast are managed in a manner that allows for current and future generations to enjoy and benefit from.

Thank you for considering the development of the Bachelor of Science in Ocean Science program. Please do not hesitate to contact me if we can be of any assistance.

Sincerely,

Karl Burgess  
Assistant Director

Coastal Office  
428 Bull Street, Suite 210  
Savannah, GA 31401  
tel 912.447.5910  
fax 912.447.0704  
cmcmillan@gaconservancy.org  
georgiaconservancy.org

February 7, 2019

Board of Regents of the University System of Georgia  
270 Washington Street, SW  
Atlanta, GA 30334

RE: Bachelor of Science in Ocean Science  
Letter of Support

INTERIM PRESIDENT  
James D. Timmons\*

Dear Distinguished Board Members:

BOARD CHAIR  
Leslie Mattingly, St. Simons Island\*

On behalf of the Georgia Conservancy, I would like to convey support for the University of Georgia developing a Bachelor of Science in Ocean Science program. Graduates from this kind of marine sciences program will have the kind of expertise and insight that serves organizations such as Georgia Conservancy well.

BOARD OF TRUSTEES  
Brent Beatty, Atlanta\*  
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Alex Robinson, Atlanta  
Stacy Shailendra, Atlanta  
W. Michael Stubbs, Macon  
Charles Thomas, Mableton  
Anita A. Timmons, Atlanta\*  
Malon Wickham, Columbus\*

The Georgia Conservancy is a statewide conservation organization that works to develop solutions to protect Georgia's environment through advocacy and collaboration on conservation issues. Founded in 1967, we are one of Georgia's oldest conservation-based nonprofit organizations, and we have a long history of advocating for coastal protection. We have had a coastal office since 1972.

In the time that the Georgia Conservancy has been developing policy and advocating for issues related to our oceans, we have found a lack of local expertise and have faced an increasingly complex regulatory and legislative environment. I have found that to be especially true in my role for the last three-plus years.

The Georgia Conservancy and other advocacy organizations would benefit from hiring or having interns from such a marine sciences program

With the emerging fisheries, oyster aquaculture and offshore drilling topics, there will be plenty of upcoming issues where expertise established through this new program will significantly benefit Georgia.

Good luck with your effort to develop this program, and let me know how I might be of assistance.

Sincerely,



Charles H. McMillan, III, P.E.  
Coastal Director, Georgia Conservancy

ADVISORY BOARD  
Claire L. Arnold, Atlanta  
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Joe Montgomery, Rome  
Laura Turner Seydel, Atlanta  
John A. Sibley III, Atlanta

\*Executive Committee Member

cc: Jim Timmons, Interim President, Georgia Conservancy



Goodwyn Mills Cawood  
Ecological Planning Group

35 Abercorn Street  
Suite 210  
Savannah, GA 31401

T (912) 655-6790

[www.gmcnetwork.com](http://www.gmcnetwork.com)  
[www.ecologicalplanning.net](http://www.ecologicalplanning.net)

February 5, 2019

Board of Regents of the University System of Georgia  
270 Washington Street, SW  
Atlanta, GA 30334

Re: Bachelor of Science in Ocean Science administered by the Department of Marine Sciences

Distinguished Board Members:

On behalf of Goodwyn Mills and Cawood, Inc. (GMC), I would like to express my support for the formation of an undergraduate program that would allow students to pursue a Bachelor of Science in Ocean Science administered by the Department of Marine Sciences at the University of Georgia. UGA Marine Extension (MarEx) and Skidaway Institute of Oceanography (SKIO) have played and continue to play a major role in the coastal Georgia community, and it makes sense that undergraduates at UGA would have a chance to focus their studies on coastal issues and take advantage of the opportunities afforded to them through these community connections. As a former employee of SKIO, and as someone with a degree in Marine Science, I can state with assurance that there are multiple opportunities for undergraduates with a degree in Ocean Science to stay and work in Georgia. Over the course of my career, I have worked as a Water Resources Planner for local governments and for several consulting firms. My marine science background has been an asset to me in these roles as it has given me a deeper understanding of the ecological impacts of land use decisions in a coastal environment. I can effectively interact with the scientists, local elected officials, staff, and the public because I understand the science behind the issues we are facing. As regional manager and vice president for a consulting firm that provides a full suite of engineering, environmental, planning and architectural services, I would be in the market to hire UGA undergraduates with Ocean Science degrees because those are precisely the employees that I believe would be best situated to assist with our environmental services in coastal Georgia. Please keep me informed regarding your progress with the development of this program, and I look forward to meeting the first undergraduate class of Ocean Science students.

Sincerely,

Courtney Reich, AICP, CFM  
Vice President  
Goodwyn Mills and Cawood, Inc.



**DEPARTMENT OF THE ARMY  
SAVANNAH DISTRICT, CORPS OF ENGINEERS  
100 W. OGLETHORPE AVENUE  
SAVANNAH, GEORGIA 31401-3640**

REPLY TO

ATTENTION OF:

March 28, 2019

Board of Regents of the University System of Georgia  
270 Washing Street, NW  
Atlanta, GA 30334

Distinguished Board Members,

Thank you for requesting our comment on the proposal on the development of a Bachelor of Science in Ocean Science program at the University of Georgia.

On behalf of the Savannah District, US Army Corps of Engineers, we would like to convey our support in the development of a Bachelor of Science in Ocean Science program. Students and graduates from such a program would assist our agency in execution of our mission and in the management of our areas natural resources.

The Savannah District, US Army Corps of Engineers, executes numerous important projects across the state of Georgia each year that must be conducted in an environmentally sustainable way. These projects include;

Studies for coastal issues such as flood damage reduction, environmental restoration, comprehensive water management and navigational improvements.

Maintenance Savannah Harbor, Brunswick Harbor and the Atlantic Intracoastal Waterway through dredging and the management of the dredged material.

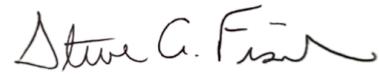
Management of 3 multi-purpose reservoirs and their associated lands.

Evaluation of permits for work in all navigable waters and wetlands.

To execute these projects the Savannah District directly employs many natural and physical scientists such as biologists, chemists, geologists and archeologists with applied knowledge in Ocean Science. In addition to direct employment, the Corps also engages effort from universities and contractors to execute this work further increasing the need for these graduates and increasing their employment opportunities.

The Corps is also working to improve methods to recruit certain positions including these natural and physical scientists. This would make is much easier to offer certain incentives and hire recent graduates from such a program.

Thank you for considering the development of the Bachelor of Science in Ocean Science program.  
Please contact us with any questions, Steve Fischer (912) 652- 5781 or Mike Montone (912) 652-5041.

A handwritten signature in black ink that reads "Steve C. Fischer". The signature is written in a cursive style with a large, sweeping "S" and a long, horizontal tail on the "F".

Steven Fischer  
Planning Branch Chief

A handwritten signature in black ink that reads "Michael B. Montone". The signature is written in a cursive style with a large, sweeping "M" and a long, horizontal tail on the "M".

Mike Montone  
Operations Division Chief



**Marine Extension and  
Georgia Sea Grant**  
UNIVERSITY OF GEORGIA



Marine Extension and Georgia Sea Grant  
1030 Chicopee Complex  
Athens, Georgia 30602  
TEL 706-542-5956  
mrisse@uga.edu  
GAcoast.uga.edu

June 24, 2019

Daniela Di Iorio ([daniela@uga.edu](mailto:daniela@uga.edu))  
Professor and Department Head  
212/250 Marine Sciences Building  
Athens GA 30602

Dear Dr. Di Iorio,

It is my pleasure to offer this letter of support for the proposal for a Bachelor of Science in Ocean Science. I think that this major is needed in Georgia and could provide exciting career opportunities for many Georgia students. I feel that undergraduate students in this major would be competitive for the internship opportunities through Marine Extension and Georgia Sea grant and would welcome the opportunity to provide them with real-world opportunities conducting applied research, education and outreach with our faculty and staff. I also think it could provide a pipeline of graduating students that would be competitive for jobs working with us as well as numerous other coastal management agencies in Georgia.

Marine Extension and Georgia Sea grant has numerous existing collaborations between faculty in Marine Sciences both here in Athens and at Skidaway Institute and our faculty and staff working on the coast. This new major would strengthen those connections to the benefit of coastal communities and ecosystems. Ocean Science graduates would be well prepared to help the State tackle critical issues facing coastal Georgia including increasing development pressure, fresh water withdrawal issues, sea level rise and coastal flooding, the growing aquaculture industry, and emerging contaminants like plastics and harmful algal blooms that pose water quality issues. In addition, equipped with knowledge of physics, biology, chemistry and geology and areas of interest in data informatics, and conservation and policy, these students would be able to contribute to more traditional coastal issues such as ecosystem conservation and fisheries management using an expanded skill set.

In summary, I think this is a well thought out proposal that could benefit the state of Georgia by providing well equipped students to a workforce that has many critical issues to solve. Thank you for the opportunity and we look forward to working with you as this degree is launched.

Sincerely,

Dr. Mark Risse, P.E.  
*Director*

## Approvals on File

**Proposal:** Major in Ocean Science (B.S.)

**College:** Franklin College of Arts and Sciences

**Department:** Marine Sciences

**Proposed Effective Term:** Fall 2020

Department:

- Marine Sciences Department Head, Dr. Daniela Di Iorio, 3/5/19

School/College:

- Franklin College of Arts and Sciences Associate Dean, Dr. Jean Martin-Williams, 4/16/19