

Program Description

Degree title: **B.S. in Science Education (Grades 9-12, Marine biology concentration)**

Sponsoring Department: **Department of Marine Science**

Objectives: The B.S. in Science Education (Grades 9-12) with a concentration in Marine biology (MSSE) will provide foundational knowledge leading to licensure in biology and general science for grades 9-12 based on a quantitative interdisciplinary understanding of coastal and marine environments. This degree integrates a broad natural science foundation (biology, chemistry, geology, mathematics, physics) with foundational knowledge in marine biology and marine geology, marine chemistry or physical oceanography. MSSE graduates will be able to apply data to demonstrate the relevance of known and emerging connections between anthropogenic activities and marine environments and ecosystems for secondary science students in standard biology classes as well as advanced classes including marine biology, marine science, and/or environmental science.

Student Learning Outcomes: Students who earn a B. S. in Science Education (Grades 9-12) with a concentration in Marine biology should be able to:

1. Explain the principles, concepts, and inter-relations of the natural sciences (biology, chemistry, geology, mathematics, physics) to the structure and function of marine and coastal environments and related resources,
2. Apply the principles of scientific inquiry to describe, analyze, and solve scientific problems involving marine and coastal environments, resources, and issues,
3. Demonstrate proficiency in education pedagogy and apply it to effectively deliver natural and marine science content to high school students,
4. Integrate knowledge of marine science and education pedagogy and practices to effectively communicate content to secondary science students,
5. Communicate effectively with peers, mentors, students, and the larger community, and
6. Obtain the related science education licensure to teach grades 9-12.

Double Majors: Students may double major in any CCU program which offers a bachelor's degree. To complete a double major, students must satisfy the major requirements for both programs and complete a minimum combined total of 48 upper-level credits in the two majors, all with a grade of 'C' or better. MSSE students that complete a second major in MSC1 may apply the 8 required 300 level foundation credits in MSC1 (MSC1 301/L, MSC1 302/L, MSC1 304/L, and/or MSC1 305L) between the MSSE and MSC1 degree¹.

¹ If the B.S. in Marine Coastal Environmental Science (MSCES) is approved after review by SC CHE during FA 2022 (potentially beginning FA 2023), MSSE majors would also be able to apply 8 required 300 level foundation credits in MSC1 (MSC1 301/L, MSC1 302/L, MSC1 304/L, and/or MSC1 305L) toward both MSSE and MCE degrees.

Degree Requirements (125-136 Credits)

Core Curriculum Requirements

Core Curriculum (36-40 Total Credit Hours)

- MSSE majors must take MATH 160 (or 160A and 160B) or MATH 161 (or 161A and 161B) to fulfill Core Curriculum requirement D (Quantitative Literacy).

Graduation Requirements

Graduation Requirements (3-6+ Credits) *

REACH Act Compliance: As part of their graduation requirements, all students at CCU must complete either *HIST 201 - History of the United States from Discovery to the Present: Discovery through Reconstruction*, or *POLI 201 - Introduction to American Government*, which are both REACH Act compliant. Sample syllabi are available upon request.

Education Requirements (grade 9-12 educator certification)

General Science Requirements (State Licensure Requirements)

- BIOL 121 - Biological Science I (3 credits) * AND
- BIOL 121L - Biological Science I Laboratory (1 credit) *

- BIOL 122 - Biological Science II (3 credits) * AND
- BIOL 122L - Biological Science II Laboratory (1 credit) *

- CHEM 111 - General Chemistry I (3 credits) * AND
- CHEM 111L - General Chemistry Laboratory I (1 credit) *

- CHEM 112 - General Chemistry II (3 credits) AND
- CHEM 112L - General Chemistry Laboratory II (1 credit)

EITHER:

- PHYS 205 - Introductory Physics for Life Sciences I (3 credits) AND
- PHYS 205L - Introductory Physics for Life Sciences I Laboratory (1 credit)

AND

- PHYS 206 - Introductory Physics for Life Sciences II (3 credits) AND
- PHYS 206L - Introductory Physics for Life Sciences II Laboratory (1 credit)

OR:

- PHYS 211 - Essentials of Physics I (3 credits) AND
- PHYS 211L - Essentials of Physics I Laboratory (1 credit)

AND

- PHYS 212 - Essentials of Physics II (3 credits) AND
- PHYS 212L - Essentials of Physics II Laboratory (1 credit)

Education Certification Requirements (State Licensure Requirements) (42 credits)

- EDML 491 Methods for Teaching Science at the Middle and Secondary levels (3 credits)
- EDSC 308 Foundations in Literacy (3 credits)
- EDSC 400 Assessment & Action Research (3 credits)
- EDSC 410 Secondary Adolescent Development & Management in the Classroom (3 credits)
- EDSC 415 Teaching in Diverse Classroom Settings (3 credits)
- EDSC 418 Reading & Writing in the Content Areas (3 credits)
- EDSC 446 Foundations of Secondary Education (3 credits)
- EDSC 480 Internship Seminar (3 credits)
- EDSC 490 Internship (for students passing all required portals) (9 credits)
- EDSP 200 Q* Foundations of Special Education (3 credits)
- EDUC 111 Exploring Teaching as a Profession (3 credits)
- EDUC 204 Q* Computer Technology & Instructional Media (3 credits)

MSCI Foundation Courses (32 Credits)

Complete the following courses:

- BIOL 121 - Biological Science I (3 credits)* AND
- BIOL 121L - Biological Science I Laboratory (1 credit) *
- BIOL 122 - Biological Science II (3 credits)* AND
- BIOL 122L - Biological Science II Laboratory (1 credit) *
- CHEM 111 - General Chemistry I (3 credits)* AND
- CHEM 111L - General Chemistry Laboratory I (1 credit) *
- CHEM 112 - General Chemistry II (3 credits) AND
- CHEM 112L - General Chemistry Laboratory II (1 credit)
- MSCI 111 - Introduction to Marine Science (3 credits)* AND
- MSCI 111L - Introduction to Marine Science Laboratory (1 credit)
- MSCI 112 - Introduction to Earth and Marine Geology (3 credits) AND

- MSCI 112L -Introduction to Earth and Marine Geology Laboratory (1 credit)
- STAT 201 - Elementary Statistics (3 credits) AND
- STAT 201L - Elementary Statistics Computer Laboratory (1 credit)

Choose from the following: (4 credits)

EITHER

- MATH 160 - Calculus I (4 credits) ** OR
- MATH 160A - Calculus I A (2 credits) ** AND
- MATH 160B - Calculus I B (2 credits) **

OR

- MATH 161 - Calculus II (4 credits) OR
- MATH 161A - Calculus II A (2 credits) AND
- MATH 161B - Calculus II B (2 credits)

Choose from the following: (8 credits)

EITHER:

- PHYS 205 - Introductory Physics for Life Sciences I (3 credits) AND
- PHYS 205L - Introductory Physics for Life Sciences I Laboratory (1 credit)

AND

- PHYS 206 - Introductory Physics for Life Sciences II (3 credits) AND
- PHYS 206L - Introductory Physics for Life Sciences II Laboratory (1 credit)

OR:

- PHYS 211 - Essentials of Physics I (3 credits) AND
- PHYS 211L - Essentials of Physics I Laboratory (1 credit)

AND

- PHYS 212 - Essentials of Physics II (3 credits) AND
- PHYS 212L - Essentials of Physics II Laboratory (1 credit)

Note: 24 credits of the foundation courses above (BIOL 121, 121L, 122, 122L, CHEM 111, 111L, 112, 112L, PHYS 205, 205L, 206, 206L or PHYS 211, 211L, 212, 212L) are shared with the Education General State Licensure requirements.

MSSE Major Requirements (12 credits)

Complete the following courses:

- MSCI 302 Marine Biology (3 credits) AND
- MSCI 302L Marine Biology Laboratory (1 credit)

Choose one course and the corresponding laboratory from the list below. (4 credits)

- MSCI 301 Physical Oceanography (3 credits) AND
- MSCI 301L Physical Oceanography Laboratory (1 credit)
- MSCI 304 Marine Geology (3 credits) AND
- MSCI 304L Q Marine Geology Laboratory (1 credit)
- MSCI 305 Marine Chemistry (3 credits) AND
- MSCI 305L Marine Chemistry Laboratory (1 credit)

Choose 4 credits from the list below.

- MSCI 376 Biology of Sea Turtles (2 credits) AND
- MSCI 376L Biology of Sea Turtles Laboratory (1 credit)
- MSCI 458 Q* Fisheries Science (3 credits) AND
- MSCI 458L Fisheries Science Laboratory (1 credit)
- MSCI 461 Marine Biological Invasions (3 credits)
- MSCI 464 Marine Molecular Ecology (3 credits) AND
- MSCI 464L Marine Molecular Ecology Laboratory (1 credit)
- MSCI 471 Biology of Marine Mammals (3 credits) AND
- MSCI 471L Biology of Marine Mammals Laboratory (1 credit)
- MSCI 472 Population Biology of Marine Organisms (3 credits) AND
- MSCI 472L Population Biology of Marine Organisms Laboratory (1 credit)
- MSCI 473 Biology of Sharks (3 credits)
- MSCI 473L Q Biology of Sharks Laboratory (1 credit)
- MSCI 476 Marine Plankton (3 credits)
- MSCI 476L Marine Plankton Laboratory (1 credit)
- MSCI 477 Biology of Coral Reefs (3 credits)
- MSCI 478 Marine Invertebrate Zoology (3 credits)
- MSCI 478L Marine Invertebrate Zoology Laboratory (1 credit)
- MSCI 479 Marine Benthic Ecology (3 credits)
- MSCI 479L Marine Benthic Ecology Laboratory (1 credit)

A grade of 'C' or better is required for all major foundation and required courses except BIOL 121, CHEM 111, and CHEM 111L. No MSCI research or internship courses may be used for MSSE major credit.

* BIOL 121, BIOL 121L; CHEM 111, CHEM 111L; and MSCI 111, MSCI 111L also satisfy the University Core Curriculum Scientific Concept requirements (Group A). Though listed above under MSSE foundation courses, the 4 credits that apply toward the University Core Curriculum are counted toward the total credits for the University Core Curriculum and not toward the MSSE foundation total.

** MATH 160 or MATH 160A and MATH 160B also satisfy the University Core Curriculum Quantitative Literacy requirement (Group D). If MATH 161 (or MATH 161A and MATH 161B) are taken instead of MATH 160/A/B, STAT 201/L may be applied to satisfy this University Core Curriculum requirement. Though listed above under MSSE foundation courses, the 4 credits that apply toward the University Course Curriculum are counted toward the total credits for the University Core Curriculum and not toward the MSSE foundation credit total.

Cognate or Minor Requirements (0 Credits)

Students majoring in Secondary Science Education (Marine biology concentration) are not required to complete a minor or cognate. However, they may elect to minor in any field in which Coastal Carolina offers a minor except Marine Science². Students seeking minors must have an advisor selected from the department offering the minor in addition to their Marine Science and Education academic advisors.

Electives: 0-13 Credits

Total Credits Required: 125-136 Credits

² MSSE majors will not be able to minor in Marine Coastal Environmental Science (MCES) either if the proposed B.S. in MCES is approved after review by SC CHE during FA 2022 (potentially beginning FA 2023).