Marine Sciences (BS): Chemistry Concentration

The degree of Bachelor of Science in Marine Science may be obtained by selecting one of five concentrations: Biological Oceanography, Chemistry, Geology, Meteorology, or Physics.

The degree of Bachelor of Science in Natural Resources is available with a concentration in Marine and Coastal Resources.

Marine scientists explore all aspects of the seas and coastal regions, seeking to understand how the oceans, their biological communities, the solid earth and the atmosphere interact. As professionals with interdisciplinary training, marine scientists are needed to advise business, industry and governments on the potential impact of human activities and the wise use of marine resources. Marine scientists work for consulting firms; regulatory agencies; the mass media; business and industry; federal, state and local governments; academic laboratories; research and education organizations; and nonprofit environmental watchdog groups.

Contact

For more information about our marine science programs, visit our website (https://meas.sciences.ncsu.edu/undergraduate/programs/marine-science/) or contact:

Maggie Puryear
Associate Director of Undergraduate Programs
mwpollar@ncsu.edu
919.513.1093

Plan Requirements

Code	Title	Hours
Core Courses/Marine Science [1]		
MEA 100	Earth System Science: Exploring the Connections	4
MEA 200	Introduction to Oceanography	3
MEA 210	Oceanography Lab	1
MEA 250	Introduction to Coastal Environments	3
MEA 251	Introduction to Coastal Environments Laboratory	1
MEA 459	Field Investigation of Coastal Processes	5
MEA 460	Principles of Physical Oceanography	3
MEA 462	Observational Methods and Data Analysis in Marine Physics	3
MEA 495	Junior Seminar in the Marine, Earth, and Atmospheric Sciences	1
Chemistry Concentration [1]		
Select one of the following pairs: [3]		4
CH 221 & CH 222	Organic Chemistry I and Organic Chemistry I Lab [1]	
CH 225 & CH 226	Organic Chemistry I for Students in Chemical Sciences and Organic Chemistry Laboratory I for Students in Chemical Sciences	
Select one of the following pairs: [3]		4
CH 223 & CH 224	Organic Chemistry II and Organic Chemistry II Lab [1]	
CH 227 & CH 228	Organic Chemistry II for Students in Chemical Sciences and Organic Chemistry Laboratory II for Students in Chemical Sciences	
CH 315 & CH 316	Quantitative Analysis and Quantitative Analysis Laboratory	4
CH 401	Systematic Inorganic Chemistry I	3
CH 403	Systematic Inorganic Chemistry II	3
CH 431	Physical Chemistry I [1]	3
CH 433	Physical Chemistry II [1]	3
MEA 323	Geochemistry of Natural Waters	3
MEA 473	Principles of Chemical Oceanography	3
Basic Math & Sciences [1]		
Select one of the following pairs: [3]		4
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory [1]	
CH 103 & CH 104	General Chemistry I for Students in Chemical Sciences and General Chemistry Laboratory I for Students in Chemical Sciences	
Select one of the following pairs: [3]		4
CH 201 & CH 202	Chemistry - A Quantitative Science and Quantitative Chemistry Laboratory [1]	
CH 203 & CH 204	General Chemistry II for Students in Chemical Sciences and General Chemistry Laboratory II for Students in Chemical Sciences	
PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory [1]	4
PY 208 & PY 209	Physics for Engineers and Scientists II and Physics for Engineers and Scientists II Laboratory [1]	4
MA 141	Calculus I [1]	4
MA 241	Calculus II [1]	4
MA 242	Calculus III [1]	4
MA 341	Applied Differential Equations I	3
Statistics Elective (p. 2)		3
Select one of the following Computer Science electives:		3
MEA 217	Introduction to Computing in the Geosciences	
CSC 111	Introduction to Computing: Python	
CSC 112	Introduction to Computing-FORTRAN	
CSC 113	Introduction to Computing - MATLAB	
CSC 116	Introduction to Computing - Java	
PY 251	Introduction to Scientific Computing	
College Requirements		
COS 100	Science of Change [2]	2
ENG 101	Academic Writing and Research [1]	4
Select one of the following Advanced Writing courses:		3
ENG 331	Communication for Engineering and Technology	
ENG 332	Communication for Business and Management	
ENG 333	Communication for Science and Research	
GEP Courses		

GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)	6
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)	6
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)	2
GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)	3
GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement)	
GEP Foundations of American Democracy (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-fad/) (verify requirement)	
World Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/) (verify requirement)	
Free Electives	
Free Electives (12 Hr S/U Lmt) [4]	3
Total Hours	**120**

[1] Grade of C- or higher required in CH 101, 201, 221, 223, 431, 433; ENG 101; MA 141, 241, 242; PY 205, 206, 208, 209. No more than one D will be accepted in MEA core courses and concentration courses. No more than one D will be accepted in other basic math or science courses.

[2] COS 100 is for new freshmen only. Transfer students will need to select a course from the GEP Interdisciplinary Perspectives course list.

[3] Students planning to double major in the BS or BA in Chemistry should choose the general and organic chemistry series for chemistry majors.

[4] Free electives may not be CH 111, MA 100, MA 101, MA 103, MA 107, MA 108, or MA 111.

Statistics Electives

Code	Title	Hours
ST 311	Introduction to Statistics	3
ST 312	Introduction to Statistics II	3
ST 350	Economics and Business Statistics	3
ST 370	Probability and Statistics for Engineers	3
ST 371	Introduction to Probability and Distribution Theory	3
ST 372	Introduction to Statistical Inference and Regression	3

Semester Sequence

This is a sample.

First Year		
Fall Semester		**Hours**
CH 101 & CH 102 or CH 103 ***and*** CH 104	Chemistry - A Molecular Science (CP) [1, 3] or General Chemistry I for Students in Chemical Sciences ***and*** General Chemistry Laboratory I for Students in Chemical Sciences	4
COS 100	Science of Change [2]	2
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
MEA 100	Earth System Science: Exploring the Connections [1]	4
MA 141	Calculus I (CP) [1]	4
	Hours	**15**
Spring Semester		
CH 201 & CH 202 or CH 203 ***and*** CH 204	Chemistry - A Quantitative Science (CP) [1, 3] or General Chemistry II for Students in Chemical Sciences ***and*** General Chemistry Laboratory II for Students in Chemical Sciences	4
MA 241	Calculus II (CP) [1]	4
ENG 101	Academic Writing and Research [1]	4
GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
	Hours	**15**
Second Year		
Fall Semester		
CH 221 & CH 222 or CH 225 ***and*** CH 226	Organic Chemistry I [1, 3] or Organic Chemistry I for Students in Chemical Sciences ***and*** Organic Chemistry Laboratory I for Students in Chemical Sciences	4
MA 242	Calculus III [1]	4
MEA 200 & MEA 210	Introduction to Oceanography and Oceanography Lab (CP) [1]	4
PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory (CP) [1]	4
	Hours	**16**
Spring Semester		
CH 315 & CH 316	Quantitative Analysis and Quantitative Analysis Laboratory [1]	4
CH 223 & CH 224 or CH 227 ***and*** CH 228	Organic Chemistry II [1, 3] or Organic Chemistry II for Students in Chemical Sciences ***and*** Organic Chemistry Laboratory II for Students in Chemical Sciences	4
MEA 250 & MEA 251	Introduction to Coastal Environments and Introduction to Coastal Environments Laboratory [1]	4
PY 208 & PY 209	Physics for Engineers and Scientists II and Physics for Engineers and Scientists II Laboratory (CP) [1]	4
	Hours	**16**
Third Year		
Fall Semester		
CH 401	Systematic Inorganic Chemistry I [1]	3
CH 431	Physical Chemistry I [1]	3
MA 341	Applied Differential Equations I [1]	3
MEA 460	Principles of Physical Oceanography [1]	3
Free elective [4]		3
	Hours	**15**

Spring Semester		
CH 403	Systematic Inorganic Chemistry II [1]	3
CH 433	Physical Chemistry II [1]	3
MEA 462	Observational Methods and Data Analysis in Marine Physics [1]	3
MEA 495	Junior Seminar in the Marine, Earth, and Atmospheric Sciences	1
Statistical Science Option Elective (p. 2) [1]		3
	Hours	**13**
Summer		
MEA 459	Field Investigation of Coastal Processes [2]	5
	Hours	**5**
Fourth Year		
Fall Semester		
Advanced Writing Elective (p. 1)		3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)		3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
MEA 473	Principles of Chemical Oceanography [1]	3
	Hours	**13**
Spring Semester		
Computer Science Option Elective (p. 1) [1]		3
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)		3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
MEA 323	Geochemistry of Natural Waters [1]	3
	Hours	**12**
	Total Hours	**120**

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[3] Students planning to double major in the BS or BA in Chemistry should choose the general and organic chemistry series for chemistry majors.

[4] Free electives may not be CH 111, MA 100, MA 101, MA 103, MA 107, MA 108, or MA 111.

Career Opportunities

MEAS undergraduate degree programs provide talented students with the foundation of scientific knowledge required for careers in government, industry, or academia. Many students pursue graduate degrees after completion of an undergraduate degree in Marine Science.

Marine Sciences graduates go on to become oceanographers, to manage our coastal resources, model air-sea interaction, and explore global climate change. They conduct basic and applied research, serving as environmental consultants for industry and governmental agencies, policy and management experts for governmental agencies, and environmental science educators. Graduates with a Natural Resources degree are versed in the fundamental processes and interdisciplinary nature of the coastal zone. As scientists, managers, administrators, and regulators, they make decisions regarding use and conservation of coastal and marine resources.

MEAS graduates play a key service role for the State of North Carolina, assisting in everything from forecasting severe storms and analyzing the impact of atmospheric pollutants on agriculture and our estuaries, to determining the effects of toxic waste disposal on quality of surface and ground water.

Career Titles

- Chief Scientist
- Coastal Geologist
- Conservation Scientist
- Contact Diver
- Environmental Consultant
- Environmental Protection Specialist
- Environmental Research Scientist
- Environmental Scientist
- GIS and Geological Oceanography Specialist
- Marine Eco-toxicologist
- Marine Geophysicist
- Natural Science Manager
- Ocean Mapper
- Oceanographer
- Sensory Biophysicist
- Undersea Specialist
- Wildlife Biologist
- Zoologist

Learn More About Careers

NCcareers.org (https://nccareers.org/)
Explore North Carolina's central online resource for students, parents, educators, job seekers and career counselors looking for high quality job and career information.

Occupational Outlook Handbook (https://www.bls.gov/ooh/)
Browse the Occupational Outlook Handbook published by the Bureau of Labor Statistics to view state and area employment and wage statistics. You can also identify and compare similar occupations based on your interests.

Career One Stop Videos (https://www.careeronestop.org/)
View videos that provide career details and information on wages, employment trends, skills needed, and more for any occupation. Sponsored by the U.S. Department of Labor.

Focus 2 Career Assessment (https://careers.dasa.ncsu.edu/explore-careers/career-assessments/) (NC State student email address required)
This career, major and education planning system is available to current NC State students to learn about how your values, interests, competencies, and personality fit into the NC State majors and your future career. An NC State email address is required to create an account. Make an appointment with your career counselor (https://careers.dasa.ncsu.edu/about/hours-appointments/) to discuss the results.

Focus 2 Apply Assessment (https://www.focus2career.com/Portal/Register.cfm?SID=1929) (Available to prospective students)
A career assessment tool designed to support prospective students in exploring and choosing the right major and career path based on your unique personality, interests, skills and values. Get started with Focus 2 Apply and see how it can guide your journey at NC State.

Marine Careers (https://www.marinecareers.net/)

Careers in Oceanography, Marine Science, & Marine Biology (https://ocean.peterbrueggeman.com/career.html)

Association for the Sciences of Limnology and Oceanography (https://www.aslo.org/)