

MARINE SCIENCE, PH.D.

Learning Outcomes

- Students will formulate clear and testable research hypotheses.
- Students will communicate orally to demonstrate their ability to present scientific results clearly, logically, and critically. For PhD students a higher level of communication is expected relative to the MS.
- Students will communicate in writing to demonstrate their ability to present scientific results clearly, logically, and critically. For PhD students a higher level of communication efficiency and clarity is expected relative to the MS.
- Students will apply scientific methodology, quantitative problem-solving, and experimental techniques within the core areas of marine science. PhD students must demonstrate a more detailed proficiency with these skill in order to demonstrate an ability to conduct independent research.
- Students will demonstrate clear understanding of the four core areas of Marine Science (Biology, Chemistry, Geology, and Physics). Each core area is a subfield of science. The PhD student is expected to have a more detailed grasp of issues in these core areas as they affect the underlying research questions and methodologies.

Degree Requirements (60 Post-Baccalaureate Hours)

General requirements for degrees in Marine Science are the same as those established by the Graduate School. The Ph.D. program of study and other specific degree requirements are planned in consultation with the graduate student, the graduate student's advisory committee, the Marine Science Graduate Studies Committee, and the Marine Science Program Director.

The Ph.D. degree requires the satisfactory completion of a minimum of 60 credit hours (including only 12 hours of 899, Dissertation Preparation) beyond the baccalaureate, or a minimum of 30 credit hours (including only 12 hours of 899) beyond the master's degree. The core courses (12 hours) are required unless exempted. Students must complete at least half of their credit hours, exclusive of 12 hours of 899, in courses numbered 700 and higher.

Ph.D. students must achieve and maintain an overall GPA of 3.00 on all courses taken for graduate credit and complete each of the core courses with a minimum grade of B.

The Ph.D. degree requires a research plan presentation, a comprehensive exam, a peer-reviewed publication, a written dissertation, and a dissertation defense.

Ph.D. students must achieve and maintain an overall GPA of 3.00 on all courses taken for graduate credit and complete each of the core courses with a minimum grade of B.

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Required Courses for Marine Science Program

The following courses are required for students in the Marine Science Program unless they are specifically exempted:

Course	Title	Credits
MSCI 545	Geological Oceanography	3
MSCI 750	Advanced Biological Oceanography	3
MSCI 781	Physical Oceanography	3
MSCI 782	Chemical Oceanography	3
Total Credit Hours		12

Areas of Emphasis in Marine Science

A number of courses exist in various departments and colleges that enable students to specialize in a particular area of emphasis in marine science.

- Marine biology/Biological oceanography
- Marine chemistry/Chemical oceanography
- Marine geology/Geological oceanography
- Physical oceanography/Atmospheric dynamics

Non-MSCI Courses Acceptable for Major Credit

Course	Title	Credits
BIOL 534	Animal Behavior	3
BIOL 534L	Animal Behavior Laboratory	1
BIOL 543	Comparative Physiology	3
BIOL 543L	Comparative Physiology Laboratory	1
BIOL 570	Principles of Ecology	3
BIOL 570L	Principles of Ecology Laboratory	1
BIOL 651	Limnology	4
BIOL 722	Aquatic Bacteriology	3
BIOL 722L	Aquatic Bacteriology Laboratory	1
BIOL 727	Marine Phytoplankton	3
BIOL 728	Advanced Phycology	3
BIOL 729	The Biology of Fish	3
BIOL 730	The Biology of Fish	3
BIOL 731	Advanced Invertebrate Zoology I	3
BIOL 755	Quantitative Ecology	3
BIOL 759	Physiological Ecology	3
BIOL 760	Electron Microscopy	3
BIOL 760L	Electron Microscopy Laboratory	1
CHEM 511	Inorganic Chemistry	3
CHEM 541L	Physical Chemistry Laboratory	2
CHEM 542	Physical Chemistry	3
CHEM 542L	Physical Chemistry Laboratory	2
CHEM 729	Special Topics in Analytical Chemistry	3
CHEM 741	Chemical Thermodynamics	3
EMCH 501	Engineering Analysis I	3
EMCH 502	Engineering Analysis II	3
EMCH 741	Viscous and Turbulent Flow	3
EMCH 751	Advanced Heat Transfer	3
EMCH 794	Thermodynamics	3
ECIV 751	Water and Wastewater Treatment Theory I	3
ECIV 752	Water and Wastewater Treatment Theory II	3
ECIV 755	Industrial Wastewater Treatment	3
ECIV 765	Erosion and Sediment Control	3
GEOG 510	Special Topics in Geographic Research	3

GEOG 531	Quantitative Methods in Geographic Research	3
GEOG 541	Advanced Cartography	3
GEOG 545	Synoptic Meteorology	4
GEOG 546	Applied Climatology	4
GEOG 551	Principles of Remote Sensing	3
GEOG 554	Spatial Programming	3
GEOG 563	Advanced Geographic Information Systems	3
GEOG 763	Seminar in Geographic Information Systems	3
GEOL 516	Sedimentology	4
GEOL 518	Surface to Subsurface Stratigraphy	3
GEOL 520	Isotope Geology and Geochronology	3
GEOL 546	Marine Geophysics	3
GEOL 570	Environmental Hydrogeology	3
GEOL 722	Aqueous Geochemistry	3
GEOL 750	Basin Analysis Seminar	3
GEOL 751	Carbonate Petrology	3
MATH 520	Ordinary Differential Equations	3
MATH 521	Boundary Value Problems and Partial Differential Equations	3
MATH 526	Numerical Linear Algebra	4
MATH 527	Numerical Analysis	3
MATH 544	Linear Algebra	3
MATH 723	Differential Equations	3
MATH 726	Numerical Differential Equations I	3
PHYS 503	Mechanics	4
PHYS 506	Thermal Physics and Statistical Mechanics	3
POLI 760	American Government and Politics	3
POLI 774	The Public Policy Process	3
POLI 777	Policy Evaluation	3
STAT 516	Statistical Methods II	3
STAT 518	Nonparametric Statistical Methods	3
STAT 519	Sampling	3
STAT 700	Applied Statistics I	3
STAT 701	Applied Statistics II	3

Total Credit Hours **195**