Oceanography and Coastal Sciences

4570 Nuclear Facility Safety (3) Prereq.: PHYS 2102 or equivalent. Safety analysis of facilities that utilize radiation sources in medicine, industry, and industrial sites; safety assessment; radiological safety; emergency plans; emergency preparedness; emergency procedures; and dose computations; and emergency and dose commitments; and engineered safeguards.

7115 N-1 Stable Tracer Methodology for Biological Sciences (2) S-E Prereq.: consent of instructor. 1 hr. lecture; 3 hrs. lab. Quantitative N-15 tracer applications and methodology in biological nitrogen systems, combining N-15 procedures with mass spectrometer techniques.

7520 Nuclear Reactor Materials (3) V Principlies governing structure, properties, and materials used in nuclear reactors; nuclear reactor radiation effects, problems in selection, fabrication, and use of these materials.

7525 Marine and Engineering Laboratory (2) S-E Prereq.: credit or registration in NS 7527. 6 hrs. lab. Operation of nuclear counting and spectroscopy systems; measurements of neutron behavior in multiplying and non-multiplying media; development of design parameters from empirical data.

7527, 7528 Reactor Engineering (3.5) F, S Prereq.: consent of department. NS 7527 is prerequisite for 7528. Basic concepts of reactor physics; slowing-down theory, homogeneous and heterogeneous reactors; diffusion and transport theories for neutron flux calculations; criticality calculations; one-group, two-group, and multigroup methods; core burn-up analysis.

7529 Nuclear Dynamic (3) Prereq.: NS 7527 and credit or registration in NS 7527. Transient reactor analysis; analytical and numerical point kinetics calculations; perturbation theory expressions for reactivity; feedback effect; fuel behavior; criticality, safety; feedback and stability; control; neutrons and thermal hydraulic transients; space-time kinetics.

7555 Nuclear Reactor Analysis (3) S Prereq.: MATH 4038 or 4340 and NS 7527, or equivalent. Numerical methods and solutions to multip组 neutron diffusion and transport equations; rod transport; nodal techniques; applications to fuel management and light water reactor core physics analysis; calculation of temperature coefficients; advanced reactor systems.

7566, 7567 Advanced Nuclear Reactor Systems (3.3,3.5,3.7) F,S Prereq.: NS 4527 or equivalent. Engineering aspects of fissile reactor systems, including fuel behavior, energy removal, materials selection, and core interface with the balance of the plant.

7571 Dynamics in Flow and Heat Transfer (3) Prereq.: ME 4433 or equivalent. Modeling and analysis of liquid-vapor flow systems and applications in nuclear reactor design and safety; nuclear phenomena; boiling heat transfer; burnup, condensation; flow instabilities, critical flow, of coolant accidents.

OCEANOGRAPHY AND COASTAL SCIENCES

• OCS

General education courses are marked with stars (★). ★1055 Introduction to Oceanography (3) An honors course, OCS 1055, is also available. Credit will not be given for both OCS 1055 and OCS 1055. The world's oceans, their origin and evolution; interactions between physical, geological, chemical, and biological processes in the marine environment; the physical disciplines of oceanography.

★1066 HONORS: Introduction to Oceanography (3) Similar to OCS 1055 with special honors emphasis for qualified students. Credit will not be given for both OCS 1055 and OCS 1055. The world's oceans, their origin and evolution; interactions between physical, geological, chemical, and biological processes of the ocean; effect of human activities.


2008 Introduction to Marine Sciences: Life Processes (4) S 3 hrs. lecture and 2 fieldtrips. Lab fee and fieldtrip required. For these courses, and CSCI 1240 or CSC 2533. Introduction to MATLAB with emphasis on coastal and oceanographic data visualization and manipulation. Importing large datasets into MATLAB, 2D, and 3D plotting, mapping, and analysis. Quantitative data on physical processes, manipulating color bars, animating data and exporting images for presentations and publications.

2095 Introduction to Marine Sciences (4) S 3 hrs. lecture and 2 fieldtrips. Lab fee and fieldtrip required. Marine science: coastal, estuarine, and oceanic processes, responses, and relationships.


2150 Introduction to MATLAB for Coastal Sciences (3) Prereq.: OCS 2007 and OCS 2008. 3 hrs. lecture. Credit will not be given for both OCS 2150 and OCS 2150. Introduction to MATLAB with emphasis on coastal and oceanographic data visualization and manipulation. Importing large datasets into MATLAB, 2D, and 3D plotting, mapping, and analysis. Quantitative data on physical processes, manipulating color bars, animating data and exporting images for presentations and publications.

2155 Introduction to Marine Sciences (4) S 3 hrs. lecture and 2 fieldtrips. Lab fee and fieldtrip required. Marine science: coastal, estuarine, and oceanic processes, responses, and relationships.

2156 Introduction to Marine Sciences (4) Prereq.: OCS 2150 or consent of instructor. 3 hrs. lecture; 4 hrs. lab. See BIOL 4052.

4020 Coastal Morphodynamics (3) Prereq.: MATH 1021 or 1022, or 1023. Also offered as GEOL 4024. Basic morphodynamic processes operating along coasts; emphasis on physiographic factors; wave action; sediment transport; interactions with other processes and forces.

4030 Techniques of Research Presentation (1) F,S Pass-fail grading. May be taken for a max. of 2 hrs. of credit when topics vary.

4040 Environmental Pollution Transport Processes (3) Prereq.: CHEM 1201, MATH 1550, and PHYS 2001. Application of fluid-earth physical principles to characterize pollutant dispersion and transport processes in atmospheric, oceanic, and terrestrial environments, particularly across the coastal zone.

4103 Salt Marsh Ecology (3) Prereq.: BIOL 1202 and 1209. 2 hrs. lecture; 3 hrs. lab. Interactions among plant, animal, and microbial communities; sediment processes; and response. Special topics will vary. May be taken for a max. of 3 hrs. of credit when topics vary.

4105 Ocean to Estuaries I: Geology and Physics (5) F Prereq.: Two semester introductory courses in physics and geology, MATH 1530 and 1552. Major geological and physical processes and products of the world's oceans, including the open ocean, continental margins, estuaries, and intertidal areas.

4106 Ocean to Estuaries II: Chemistry and Biology (5) S Prereq.: CHEM 1201 and 1202, BIOL 1201 and 1202, MATH 1550 and 1552. Major chemical and biological processes within the world's oceans, including the open ocean, continental margins, estuaries, and intertidal marshes.

4111 Physical Oceanography (3) F Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4112, 4113, 4114, and 4115. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4112 Introduction to Marine Vertebrates (3) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4113, 4114, and 4115. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4113 Marine Science for Teachers (3) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4114, 4115, 4116, and 4117. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4114 Marine Zoology (3) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4115, 4116, and 4117. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4115 Marine Biology (3) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4116, 4117, and 4118. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4116 Marine Zoology II (3) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4117 and 4118. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4117 Marine Zoology III (3) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4118. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4118 Marine Zoology IV (3) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4119 and 4120. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4120 Botanical Oceanography (3) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4121 and 4122. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4121 Marine Botany (3) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4122. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4150 Ocean to Estuaries II: Physical Oceanography (5) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4151, 4152, 4153, and 4154. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4151 Ocean to Estuaries III: Physical Oceanography (5) Prereq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Prerequisite for 4152, 4153, and 4154. 6 sem. hrs. of credit. May be taken for a max. of 6 sem. hrs. of credit when topics vary.