

MARINE SCIENCE (MASC)

MASC 440. Marine Ecology. 3 Credits.

Survey of the ecological processes that structure marine communities in a range of coastal habitats. Course emphasizes experimental approaches to addressing basic and applied problems in marine systems.

Rules & Requirements

Requisites: Prerequisites, BIOL 201; or BIOL 475; or BIOL 103, BIOL 104, and BIOL 260.

Grading Status: Letter grade.

Same as: BIOL 462.

MASC 473. The Changing Coasts of Carolina. 3 Credits.

A rigorous combination of field work, lab work, and colorful, original contemporary writing on the natural world will help tell the story of our many, evolving North Carolina coasts. Combining marine science and the creative literary arts, this immersive course will explore issues of change over many eras. This combination of social, cultural, and scientific observation will lead to imaginatively constructed, well-written non-fiction reportage about one of North America's most productive, compelling, and challenging regions.

Rules & Requirements

Making Connections Gen Ed: CI, EE- Field Work.

Grading Status: Letter grade.

Same as: ENGL 473.

MASC 705. How to Give a Seminar. 1 Credits.

Discussion of methods and strategies for giving effective technical presentations. Topics will include seminar structure, use of visual aids, personal and professional presentation, and responding to questions.

Rules & Requirements

Grading Status: Letter grade.

MASC 706. Student Interdisciplinary Seminar. 1 Credits.

Marine Sciences graduate students will prepare and present a seminar on an interdisciplinary topic from contemporary research in marine systems.

Rules & Requirements

Requisites: Prerequisite, MASC 705.

Grading Status: Letter grade.

MASC 741. Seminar in Marine Biology. 2 Credits.

Discussion of selected literature in the field of marine biology, ecology, and evolution.

Rules & Requirements

Grading Status: Letter grade.

MASC 742. Molecular Population Biology. 4 Credits.

Hands-on training, experience, and discussion of the application of molecular genetic tools to questions of ecology, evolution, systematics, and conservation.

Rules & Requirements

Requisites: Prerequisite, BIOL 471; Permission of the instructor for students lacking the prerequisites.

Grading Status: Letter grade.

Same as: BIOL 758.

MASC 750. Modeling Diagenetic Processes. 3 Credits.

An introduction to the theory and application of modeling biogeochemical processes in sediments. Diagenetic theory, numerical techniques, and examples of recently developed sediment models. Three lecture hours a week.

Rules & Requirements

Requisites: Prerequisite, MASC 480; Permission of the instructor for students lacking the prerequisite.

Grading Status: Letter grade.

MASC 761. Geophysical Fluid Dynamics. 3 Credits.

Momentum equations in a rotating reference frame, vorticity, potential vorticity, circulation, the shallow water model, Rossby and Kelvin waves, the Ekman layer. Three lecture hours a week.

Rules & Requirements

Requisites: Prerequisite, MASC 560 or MATH 528; permission of the instructor for students lacking the prerequisite.

Grading Status: Letter grade.

MASC 762. Ocean Circulation Theory. 3 Credits.

Theories, models of large-scale dynamics of ocean circulation. Potential vorticity, quasi-geostrophy, instabilities.

Rules & Requirements

Requisites: Prerequisite, MASC 506 or 560, or MATH 529; permission of the instructor for students lacking the prerequisite.

Grading Status: Letter grade.

MASC 763. Coastal Oceanography. 3 Credits.

Multi-disciplinary survey of circulation, sediment and biological processes operative in estuaries, on the shelf and at the shelf break.

Rules & Requirements

Requisites: Prerequisites, MASC 503 and 506; permission of the instructor for students lacking the prerequisites.

Grading Status: Letter grade.

MASC 764. Ocean Circulation Modeling. 3 Credits.

Computational methods used in modeling oceanic circulation. Numerical solution of equations governing mass, momentum, and energy equations.

Rules & Requirements

Requisites: Prerequisite, MASC 506 or MATH 529; permission of the instructor for students lacking the prerequisite.

Grading Status: Letter grade.

MASC 765. Small-Scale Physics of the Ocean. 3 Credits.

Physics of sub-mesoscale processes in the ocean. Nonequilibrium thermodynamics. Air-sea interaction. Mixing in the ocean boundary layer, convection, double diffusion. Near-inertial and high frequency internal waves. Three lecture hours a week.

Rules & Requirements

Requisites: Prerequisites, MASC 506 and 560.

Grading Status: Letter grade.

MASC 781. Numerical ODE/PDE, I. 3 Credits.

Single, multistep methods for ODEs: stability regions, the root condition; stiff systems, backward difference formulas; two-point BVPs; stability theory; finite difference methods for linear advection diffusion equations.

Rules & Requirements

Requisites: Prerequisites, MATH 661 and 662.

Grading Status: Letter grade.

Same as: MATH 761, ENVR 761.

MASC 782. Numerical ODE/PDE, II. 3 Credits.

Elliptic equation methods (finite differences, elements, integral equations); hyperbolic conservation law methods (Lax-Friedrich, characteristics, entropy condition, shock tracking/capturing); spectral, pseudo-spectral methods; particle methods, fast summation, fast multipole/vortex methods.

Rules & Requirements

Requisites: Prerequisite, MATH 761.

Grading Status: Letter grade.

Same as: MATH 762, ENVR 762.

MASC 783. Mathematical Modeling I. 3 Credits.

Nondimensionalization and identification of leading order physical effects with respect to relevant scales and phenomena; derivation of classical models of fluid mechanics (lubrication, slender filament, thin films, Stokes flow); derivation of weakly nonlinear envelope equations. Fall.

Rules & Requirements

Requisites: Prerequisites, MATH 661, 662, 668, and 669.

Grading Status: Letter grade.

Same as: MATH 768, ENVR 763.

MASC 784. Mathematical Modeling II. 3 Credits.

Current models in science and technology: topics ranging from material science applications (e.g., flow of polymers and LCPs); geophysical applications (e.g., ocean circulation, quasi-geostrophic models, atmospheric vortices).

Rules & Requirements

Requisites: Prerequisites, MATH 661, 662, 668, and 669.

Grading Status: Letter grade.

Same as: MATH 769, ENVR 764.

MASC 799. Experimental Graduate. 1-9 Credits.

Experimental graduate level courses as offered by the Department.

Rules & Requirements

Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics; 9 total credits. 1 total completions.

Grading Status: Letter grade.

MASC 893. Special Topics in Marine Geology. 1-9 Credits.

Special topics courses in Marine Geology as offered by Department.

Rules & Requirements

Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics; 9 total credits. 1 total completions.

Grading Status: Letter grade.

MASC 894. Special Topics in Biological Oceanography. 1-9 Credits.

Special topics courses in Biological Oceanography as offered by Department.

Rules & Requirements

Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics; 9 total credits. 1 total completions.

Grading Status: Letter grade.

MASC 895. Special Topics in Physical Oceanography. 1-9 Credits.

Special topics courses in Physical Oceanography as offered by Department.

Rules & Requirements

Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics; 9 total credits. 1 total completions.

Grading Status: Letter grade.

MASC 896. Special Topics in Chemical Oceanography. 1-9 Credits.

Special topics courses in Chemical Oceanography as offered by Department.

Rules & Requirements

Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics; 9 total credits. 1 total completions.

Grading Status: Letter grade.

MASC 897. Special Topics in Marine Sciences. 1-9 Credits.

Special topics courses in Marine Sciences as offered by Department.

Rules & Requirements

Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics; 9 total credits. 1 total completions.

Grading Status: Letter grade.

MASC 940. Research in Marine Sciences. 2-21 Credits.**Rules & Requirements**

Grading Status: Letter grade.

Same as: BIOL 953.

MASC 993. Master's Research and Thesis. 3 Credits.**Rules & Requirements**

Repeat Rules: May be repeated for credit.

MASC 994. Doctoral Research and Dissertation. 3 Credits.**Rules & Requirements**

Repeat Rules: May be repeated for credit.