

MARINE SCIENCE (MASC)

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

Grading Status: Letter grade.

Same as: BIOL 953.