

MA (BMA) 574

Time: 1:30 - 2:45 MW

Place: SAS 1220

Instructor: Ralph Smith

Office: SAS 4140 318, Tel: 515-7552

Email: rsmith@ncsu.edu

Web: <http://www4.ncsu.edu/~rsmith/>

Text: *Mathematical and Experimental Modeling of Physical and Biological Processes* by H.T. Banks and H.T. Tran, CRC Press, 2009.

Computing: We will use Matlab and Maple.

Grades: The gradescale is: 90-100 A-,A; 80-89 B-,B,B+; 70-79 C-,C,C+; 60-69 D-,D,D+; below 60: F. The grades are based on the following coursework:

Homework and Projects:	60 %
Midterm Exam:	15 %
Final Exam (May 5, 2010):	25 %

Course Topics:

- Acoustics and Fluids
 - Acoustics and wave phenomena
 - Fluid principles: Euler and Navier–Stokes models
- Materials Concepts and Structural Models
 - Fundamentals of elasticity and viscoelasticity
 - Structural models for rods, beams, membranes and shells
 - Smart material applications
 - Laboratory experiment: beam vibrations
- Electromagnetic Theory
 - Basic principles and Maxwell's equations
- Numerical Solution Techniques for PDE
 - Finite difference techniques
 - Galerkin and finite element methods
- Deterministic and statistical parameter estimation techniques
- Verification and validation of models

Academic Integrity and Disabilities Information: This is provided at the following web sites:

http://www.ncsu.edu/provost/academic_regulations/integrity/reg.htm

http://www2.ncsu.edu/ncsu/stud_affairs/counseling_center/dss/