Time: 11:45-12:35 MWF
Place: Riddick 339
Instructor: Ralph Smith
Office: SAS 4140, Tel: 515-7552
Email: rsmith@ncsu.edu
Web: http://www4.ncsu.edu/~rsmith/


Computing: We will use MATLAB.

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 (8-11 am, December 11, 2017): 25%

Course Topics:

- Motivating Examples and Modeling Concepts
- Numerical Methods for Initial Value Problems and Boundary Value Problems
- Deterministic and Frequentist Model Calibration
  - Deterministic parameter estimation
  - Fundamentals of probability and statistics
  - Frequentist statistical parameter estimation
- Compartmental Analysis and Conservation Laws
  - Advection, convection and diffusion processes
  - Conservation of mass and the material derivative
  - Numerical solution techniques
  - Traffic flow models and analysis
- Energy Conservation and the Heat Equation
  - Heat conduction and the heat equation
  - Application Module: Modeling a catalytic converter
- Population Models
  - Logistic, predator-prey and size-structured models
- Epidemic Models: SIR models
- Neutron Transport Models – Boltzmann equation

Academic Integrity and Disabilities Information: This is provided at the websites:
http://www.ncsu.edu/provost/academic_regulations/integrity/reg.htm
http://www2.ncsu.edu/ncsu/stud_affairs/counseling_center/dss/