MA (BMA) 573

Time: 1:30 - 2:45 MW
Place: HA 265
Instructor: Ralph Smith
Office: HA 318, Tel: 515-7552
Email: rsmith@eos.ncsu.edu
Web: http://www4.ncsu.edu/~rsmith/

Text: Class notes.

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:

<table>
<thead>
<tr>
<th>Course Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework and Projects</td>
<td>60 %</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>15 %</td>
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<tr>
<td>Final Exam</td>
<td>25 %</td>
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</tbody>
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Course Topics:

- Motivating Examples and Modeling Concepts
  - Dimensional analysis and scaling

- Compartmental Analysis and Conservation Laws
  - Advection, convection and diffusion processes
  - General transport equations
  - Conservation of mass and momentum
  - Traffic flow and analysis

- Heat Transfer
  - Laboratory experiment: Heat conduction in a rod

- Population Models

- Analytic solution techniques for PDE
  - Method of characteristics
  - Separation of variables

- Numerical solution techniques for PDE
  - Finite differences
  - Finite elements

- Validation and Verification Techniques

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/