Numerical Analysis
MAD 3401

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Chapter 1,2,3,4,6,7

Please bring your text to each class meeting—we may use it as a source of examples to work.
General Expectations

You are expected to take notes during each lecture. These notes, along with the text are the key sources for studying. Performance at a high level in this class is very much expected.

Resources

When you need help in the course, there are some options:

- Talk to your classmates.
- Come and talk with me. The best time is in my office hours, but you can call or e-mail me to arrange another time.
Grading

- Homework — 50%
- Midterm 1 — 15% (Jan. 29)
- Midterm 2 — 15% (Mar. 12)
- Final — 20% (Apr. XX, 12:00 PM - 2:00 PM)

At the end of the course your final grade will be based on your percentage of the total available points.

<table>
<thead>
<tr>
<th>Grade</th>
<th>A</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
<th>C-</th>
<th>D-F</th>
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</thead>
<tbody>
<tr>
<td>Score</td>
<td>≥ 90</td>
<td>≥ 85</td>
<td>≥ 80</td>
<td>≥ 75</td>
<td>≥ 70</td>
<td>≥ 65</td>
<td>≥ 60</td>
<td>≥ 55</td>
<td>&lt; 55</td>
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Homework and Exams

- **Homework**
  You are responsible to work all of the assigned problems.

- **Exams**
  There will be two mid-term exams and a final exam.

**WARNING:**
Please consult your calendar to be sure that you can take all the exams. **There will be no make-up exams.**

**A VERY GOOD WAY TO PREPARE FOR EXAMS** is to be sure you have understood the reading and done (and understood!) all of the assigned problems. Many of the questions I ask are **closely related to the homework** and **to the examples shown in class**.
Numerical Analysis

Branch of mathematics proposes, develops, analyzes and applies methods from scientific computing to several fields including analysis, linear algebra, geometry, approximation theory, functional equations, optimization and differential equations.

Other disciplines such as physics, the natural and biological sciences, engineering and economics and the financial sciences frequently give rise to problems that need scientific computing for their solutions.

Crossroad of several disciplines of great relevance in modern applied sciences, crucial tool for their qualitative and quantitative analysis.
Continual development of computers and algorithms,

Tackle problems of such a large size that real-life phenomena can be simulated providing accurate responses at affordable computational cost.

No black-box methods or algorithms exist that can effectively and accurately solve all kinds of problems.

It is important to prove, but it is more important to improve.
Schedule of Lectures

- **Chapter 1**
  Review of Calculus, Computer Arithmetic, Numerical Software

- **Chapter 2**
  Solutions of Equations in One Variable

- **Chapter 3**
  Interpolation and Polynomial Approximation

- **Chapter 4**
  Numerical Differentiation and Integration

- **Chapter 6**
  Direct Methods for Solving Linear Systems

- **Chapter 7**
  Iterative Techniques in Matrix Algebra