

## MATH 393 NUMERICAL ANALYSIS

Text: <http://lib-www.lanl.gov/numerical/bookcpdf.html>

Meetings: D016, MWF 10:30

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Office/Phone/Hours: Duffy 272 /508 565 1272/ MW 11:20 a.m.

Grading policy: Final Grade =  $\frac{1}{4}(2E + HW + F)$  with  $E$  a take-home midterm (late in the term),  $HW$  the average of occasional homework and class participation evaluations, and  $F$  the final exam score—all out of 100. Warning: You must know Calculus I-IV and Linear Algebra very well.

### Syllabus

- 1) Algebra (Chs 2, 9, 11)
  - Linear Equations and Matrix Inversion
  - Newton's Method
- 2) Calculus (Chs 4, 10)
  - Open and Closed Integration Techniques
  - Improper Integrals
- 3) Differential Equations (Chs 16, 17, 19)
  - Euler's Method for Scalar ODEs
  - Exponentiation of Matrices
  - Vector ODEs and Higher Order Scalar ODEs
  - Runge-Kutta Methods
  - Asymptotics
  - PDEs
- 4) Fourier Analysis (Chs 12, 13)
  - The Fourier Series and Integral Transform
  - The Fast Fourier Transform