01:198:323: Numerical Analysis and Computing

CS dept at Rutgers University,
Spring 05, Syllabus for Sections: 7, 9

Instructor: Xuerong Yong, Email: xryong@dimacs.rutgers.edu, Tel: 732-445-4576, Office Hours: Mondays: 4:30 - 5:30 pm, in Room 421, CoRE Bldg, BC.

Teaching Assistant: Chris Mesterharm, Email: mesterha@paul.rutgers.edu, Office Hours: TBD.

- **Textbook**: "Elementary Numerical Analysis", by Kendall Atkinson and Weimin Han, John Wiley, 2004, third edition.
- **Classes**: Tuesdays and Thursdays 7:40 - 9:00 pm, in Frelinghuysen Hall-B2, CAC Geo, Str..
- **Course Homepage:** http://www.dimacs.rutgers.edu/∼xryong
- **Objectives:** Introduction to general issues arising in numerical computing (accuracy, convergence, stability, efficiency) and to specific algorithms for some important computational tasks.
- **Prerequisites:** Calculus, Linear Algebra, Language (high level)
- **Expected Work:** 'Weekly' written homework and computer* tasks ($\leq 1/4$); midterm, and a final ($\geq 3/4$). (* Any high level language known to the TA is OK and facility with **MATLAB** is encouraged.)
- **Topics:**
  1. k-digit normalized floating point numbers
  2. Nonlinear Equations
  3. Linear Systems
  4. Polynomial Approximation and Interpolation
  5. Numerical Differentiation and Integration
  6. (?) Differential Equations
  7. (?) Monte Carlo
- **References:** (on reserve at SERC reference desk, if you want to know more)
  1. "Elementary Numerical Analysis: An Algorithmic Approach", third edition,S. Conte and C. de Boor, Mc Graw-Hill, 1980.
  2. "Numerical Methods Using MATLAB", J. Matthews and K. Fink, Prentice Hall, 1999
  3. "Scientific Computing, An Introductory Survey", 2nd edition, M. T. Heath, McGraw-Hill, 2002

[NO RECITATION FIRST WEEK]