Numerical Methods II

G63.2020 / G22.2421
Spring 2007, Mondays 5:10-7:00 pm, WWH Room 101

• **Instructor:** Weiqing Ren  
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• **Office hours:** Drop by any time for short questions; Send email to make an appointment for longer ones.

• **Class mailing list:** G22_2421_001_sp07@cs.nyu.edu  
  Important announcements will be sent by email. You need to subscribe this mailing list at the following webpage:  
  http://www.cs.nyu.edu/mailman/listinfo/g22_2421_001_sp07

• **Course webpage:**  
  http://www.cims.nyu.edu/~weiqing/courses/numerical_methods_II_sp07

• **Prerequisite:** Numerical linear algebra, elements of ODE and PDE.

• **Requirements:** 6-7 homework assignments, including programming assignments, using Matlab, fortran or any alternatives. Homework will be handed out in class and due at midnight on the given date. Please hand your completed homework to me or leave it under my office door.

  The final exam will be an oral exam in my office.

**Required text:** *A first course in the numerical analysis of differential equations* by Arieh Iserles, Cambridge University Press.

• **Syllabus:** This course will cover fundamental methods that are essential for numerical solution of differential equations. It is intended for students familiar with ODE and PDE and interested in numerical computing; computer programming assignments form an essential part of the course. Topics to be covered include: (1) Nonlinear equations and Newton’s method; (2) Time-stepping methods for ODEs including Euler’s method, multistep methods and Runge-Kutta methods, convergence, accuracy and stability issues; (3) Finite difference and (introductory) finite element methods for elliptic equations, iterative methods exploiting special structures, fast solvers; (4) Numerical methods for parabolic and hyperbolic partial differential equations.