Math 5630/6630 - Introduction to Numerical Analysis I

Summer 2007

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Bulletin Description: Math 5630/6630 - Introduction to Numerical Analysis I (3). Lec. 3. Pr., Math 2650, programming ability. Numerical solution of equations, polynomial approximation, numerical differentiation and integration, numerical solutions of ordinary differential equations, error analysis. Written programs using algorithms.

Text:
A.QUARTERONI, R. SACCO, AND F. SALERI, *Numerical Mathematics*, Second Edition, Springer, New York, 2007.

References:
T. A. DAVIS AND K. SIGMON, *MATLAB Primer*, Seventh Edition, Chapman & Hall/CRC, Boca Raton, 2005.
D. J. HIGHAM AND N. J. HIGHAM, *MATLAB Guide*, Second Edition, SIAM, Philadelphia, 2005.

Coverage: Parts of (Parts I, III, and IV) Chapters 2, 6–9, 11, and if time permits 12. The topics we will explore are.
Part I: Principles of numerical mathematics and floating point arithmetic.
Part III: Root finding for nonlinear equations, polynomial interpolation and approximation, numerical differentiation, and numerical integration.
Part IV: Numerical approximation of solution of ordinary differential equations (initial-value and if time permits two point boundary-value problems).

Homework: Homework (problems and computer assignments) will be assigned, graded, and will be counted towards the final grade.

Exams: There will be two one-hour exams (28% each) and a final exam (56%). Tests will be announced at least two days in advance. Make up tests will not be given unless a special circumstance exists. Tentative (one-hour exam) test dates are Friday June 1, and Friday June 15. The final exam is scheduled for Friday June 22.

Grading: The lowest one-hour exam score or one half of the final exam score will be dropped, the total of these scores will count as 84% of the final grade. Homework score will count as 16% of the final grade. Different exams will be given and different homework will be assigned to the 5630 and 6630 sections.