

Math 5630/6630 - Introduction to Numerical Analysis I

Fall, 2011

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Office Hours: TT 9:30am–11:00am and *and by appointment*

Bulletin Description: Math 5630/6630 - Introduction to Numerical Analysis I. Pr., Math 2650 and programming ability. We will cover Numerical solution of equations, polynomial approximation, numerical differentiation and integration, numerical solutions of ordinary differential equations, error analysis and programming using algorithms.

Text:

Uri M. Ascher and Chen Greif, *A First Course in Numerical Methods*, Second Edition, SIAM, Philadelphia , 2011.

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: Chapters 1, 2, 3, 10, 11, 15, 16. The topics we will explore are
Principles of numerical mathematics and floating point arithmetic (Chapters 1 and 2);
Root finding for nonlinear equations (Chapter 3);
Polynomial interpolation and approximation and numerical integration (Chapters 10, 11, 15);
Numerical approximation of solution of ordinary differential equations (Chapter 16).

Homework: Homework (problems and computer assignments) will be assigned, graded, and will be counted as 30% of the final grade. For the programs students may use a high level programming language of their choice, though I will encourage the use of Matlab (students will not be allowed to use the high level built-in functions of Matlab, details will be given in class). Matlab is available at all computer labs in Parker Hall. It is also accessible remotely from your own computer. For detailed instructions, go to

www.auburn.edu/academic/cosam/departments/it/software

Computer assignment submission should include a hard copy of the computer program (annotated appropriately) and printout of output of sample runs of the code (electronic submission of program source code may also be required).

Tests and final exam: There will be two one-hour tests (20% each) and a final exam (30%). Tests will be announced at least one week in advance (also see **Important Dates**). Make up tests will not be given unless a special circumstance exists. Refer to the Tiger Cub for a description of what constitutes an acceptable excuse. If at all possible, excuses have to be submitted in advance; only in the case of an emergency, they must be submitted as soon as the situation allows (normally no later than on the first class day following the excused absence).

Grading:

Homework and programming assignments: 30%

Two tests: 40%

Final Exam 30%

A: 90-100%, B: 80-89%, C: 70-79%, D: 60-69%, F: 0-59%.

Student E-mail Policy: E-mail is considered an official medium for communicating with students. All students are responsible for checking their Auburn University issued e-mail account in a timely fashion and on a regular basis (at least once a day). Claiming not to have seen an e-mail message on time does not constitute a valid excuse. The official e-mail system for students is (the Auburn provided) user@auburn.edu and can be accessed via TigerMail (using a web browser), or IMAP clients.

Honesty: Giving or receiving aid in whatever form on an exam will result in a score of zero and may lead to Honesty Board proceedings. Refer to the Tiger Cub for information on university policies governing this matter.

Cell Phone Policy: Cell phones must be turned off during class and exam periods.

Registration: It is your responsibility to make sure that you are properly registered for this particular section of Math 5630 or Math 6630.

Important Dates: The first test is tentatively scheduled on September 27. The second test is tentatively scheduled on November 17. The final exam may be given either on the final day of class or the university scheduled time which is December 7.