MAT 362 Spring 2007 MAT 362 Numerical analysis

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Hours: MW 10:10-12:10, F 10:10-11:10

Prerequisites: Grade of C or better in MAT 137 and knowledge of a computer language.
Description: Introduction to Numerical Analysis (3). Algorithms, computational errors, single variable equations, curve fitting, interpolation, numerical differentiation and integration, numerical solutions of differential equations, and linear systems of equations. Includes computer lab.

This is a programming intensive course with several coding assignments. We are going to use mainly C++, the Standard Template Library (STL) and Unix tools. We may use a little bit of Mathematica or Matlab as well. We are going to review the required parts of C++ like the STL (especially vectors), file handling, etc. but it helps if you know how to write basic C++ code (if statement, loops, basic data types). If you have a computer running Linux than you have everything we are going to need. If you use windows then you might want to install and play around with cygwin. It's free to download. My recommendation is the university Unix machine through sgd (http://sgd.cens.nau.edu). We are going to use the C++ compiler called g++. The other most important tool we are going to use is gnuplot.
Textbook: Richard Burden, Douglas Faires: Numerical Analysis (eigth edition, but an older version should be ok)
Grading:
35% homework, quizzes, projects, presentations, attendance; 65% tests and final;

- Tests: There will be 3 midterm tests. The exact dates will be announced at least a week before the tests in class and on the course web page. Use of notes or electronic devices (calculators, cell phones, mp3 players, etc.) are not allowed on the tests. Class attendance is very important. You are responsible for material covered in class whether or not it is in the text. It is important to take notes, and review them after class.
- There will be a comprehensive final exam.
- Quiz: A quiz may be given at any time without announcement.
- Homework: Homework will be assigned and collected regularly. Check the course web page for assignments and due dates. Homework is the foundation of your learning. You cannot expect to solve the assigned problems easily. Some problems require a great deal of effort and time. Even if you are unable to solve a problem, the time spent on trying is not wasted.
  Assignments are due at the beginning of the class. No late homework is accepted, but you can turn in your work before the deadline. It is recommended to create study groups and discuss the assigned problems but unless it's a group project you need to write your final solution from scratch on your own. Write out your solutions neatly. Include the assignment number. Give detailed explanations but be concise. Do not turn in scratch work. Even if I am able to figure out what you think, I can't give you full credit for a badly written solution. Solving a problem is half of the battle, the other part is to write it down so that someone without any previous knowledge can understand it. Check your scores regularly on the grade-sheet posted on the web.
- Portfolio: Keep all your corrected papers and all your code files organized and safe. Make backups. You are going to need to create a web site with your files.

Make up tests will be given only in case of verified medical or other emergency which must be documented. You must make a reasonable effort to notify me as soon as you can, before the missed test is given. The best way to contact me is by email.

All the information on this syllabus are subject to change and any class announcements regarding the syllabus are considered official amendments to it. This syllabus and other information is available on the course web page.