

MATH 4340 - Numerical Analysis

Spring 2007

Instructor: Dan Stanescu, 218 Ross Hall, Tel. 766-4380, stanescu@uwyo.edu.

Office Hours: M 1:30-2:30PM, R 1:00-2:00PM and by appointment.

Class time & room: TR 11:00-12:15PM in EN 4066.

Text: *Applied Numerical Methods for Engineers*, Schilling, ISBN 0534370144.

Brief Course Description The course will cover basic topics in numerical analysis: generation and propagation of computer errors, interpolation, numerical integration and differentiation and solution of linear and nonlinear systems of equations. Time permitting, we will also cover the basic principles behind Monte Carlo methods. Throughout the course emphasis will be put not only on a thorough understanding of the concepts but also on the algorithmic thinking so much needed when developing and implementing numerical methods.

GRADING

- **Homework: 70%.** At least one set of homework problems will be assigned for each topic. Your solutions must be turned in within a week from the date you've been assigned the homework. I might grade all problems and am hopeful that I'll be able to; otherwise I'll randomly choose several problems in every set and grade them. Your grade for every set will be an average of the grade obtained on the graded problems. No make-ups for homeworks; however, your worst homework grade will not be taken into consideration. Note that mathematics, more than probably any other subject, can only be learned by hands-on practice. This is even more so for numerical methods, so doing all the homework problems *and writing computer implementations* by yourselves is essential to your performance in this class.

- **Final Exam: 30%.** The test will be closed-books, but you are allowed a *handwritten* letter-sized cheat sheet with the information you need on both sides, as well as a calculator. Out of necessity, the test will focus on theoretical aspects of the material, which makes the homework even more important.

- **Class participation.** Class participation (meaning both regular attendance and involvement) may make the difference whether you get an A or a B if you're on the borderline!

- **Software.** You will need either a compiler or an interpreter to solve problems requiring a computer code. While I prefer to leave the choice open to you (book uses Matlab and C), I strongly recommend the use of Maple, a high-level interpreted language which is very easy to use. Familiarizing yourself with Maple has an important long-term advantage: it will allow you to use its symbolic calculation capability with great ease for other classes. I registered this class for the Maple adoption program, which means that you can get a copy of Maple version 10 at the bargain price of \$75. To do that you'll need a code that you can get from me. Many examples that I'll present in class will use Maple code to illustrate the concepts.

The information contained herein is tentative. If the instructor finds that changes are necessary, he will announce them in class. If you have a physical, learning, or psychological disability and require accommodations, please let me know as soon as possible. You will need to register with, and provide documentation of your disability to, University Disability Support Services (UDSS) in SEO, room 330 Knight Hall, 766-6189, TTY: 766-3073.