AMSC/CMSC 466 Section 0101 Fall 2005

INTRODUCTION TO NUMERICAL ANALYSIS, I

Tu-Th 12:30-1:45, MTH 0307

Instructor

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Office Hours: Mo 1-2, Tu 2-3 (or by appointment)

Objectives

This course is intended to introduce students to the basic issues of numerical analysis: floating point computations, direct methods for linear systems, polynomial interpolation, solution of nonlinear equations and quadrature. The course will be about three quarters theory and one quarter programming using MATLAB. You can access MATLAB in a WAM Lab, in a GLUE Lab, or on your PC, if you have the Student Version or the Student Edition of MATLAB. In the WAM and GLUE Labs, MATLAB is on the Sun workstations and PCs. The Student Version is available in the bookstores and on the MathWorks website `www.mathworks.com`.

Course Outline

Chapter 1: Floating Point Arithmetic (3 lectures)
Chapter 2: Direct Methods for Linear Systems (8 lectures)
Chapter 3: Solution of Nonlinear Equations (6 lectures)
Chapter 4: Polynomial Interpolation (6 lectures)
Chapter 5: Numerical Differentiation and Integration (4 lectures)

Text

[1] E. Süli and D. Mayers, *An Introduction to Numerical Analysis*, Cambridge University Press (2003), ISBN0 521 00794 1.

Other Texts

[2] G.W. Stewart, *Afternotes on Numerical Analysis*, Society for Industrial and Applied Mathematics (1996), ISBN 0-89871-362-5.

[3] C.F. van Loan, *Introduction to Scientific Computing: A Matrix-Vector Approach Using MATLAB*, Prentice-Hall (1997), ISBN 0-13-125444-8.

[4] K.E. Atkinson, *An Introduction to Numerical Analysis*, John Wiley and Sons (1988), ISBN 0-471-62489-6.

[5] D. Kincaid and W. Cheney, *Numerical Analysis*, Brooks/Cole Publ. Co., (1991), ISBN 0-534-13014-3.

Grading Policy

The final grade will be based on homeworks (30%), two exams (20% each), and a final exam (30%). No make-up exams will be given, unless a written excuse is presented in advance and in accordance with University Policies. Computer exercises will use MATLAB and perhaps some software from [3]. Homeworks are due before class starts. There will be a penalty of 10% for one day late, 20% for two days, and so on. Homework will not be accepted after one week.

Exam 1: §§1, 2 ($\approx$ Thursday Oct 20).

Exam 2: §§2, 3, 4 ($\approx$ Thursday Dec 1).

Final Exam: §§1-5 (Tuesday, Dec 20, 1:30pm-3:30pm).

Prerequisites

Calculus MATH 240 and 241 (or equivalent).