

Math 210, Spring 2013

Introduction to Mathematical Computing

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Lectures: MWF 2-3 in LSK 460

Computer Lab: Tuesdays 2-3 in LSK 121. Lab quizzes will be held in this hour every week.

Course outline: This course is intended mainly for students majoring in mathematics and statistics, typically in second year. It gives an introduction to algebraic, numerical and graphical computational tools which are useful in many areas of these subjects. We will learn to use the software packages Maple and MATLAB to solve problems symbolically or to approximate them numerically to a desired precision.

- **Part I: Introduction to Maple**

- Introduction to symbolic calculations, elementary commands and functions, symbolic differentiation and integration, systems of linear equations;
- Loops and conditional statements;
- Applications including the solution of differential equations.

- **Part II: Introduction to MATLAB**

- Basic calculations involving vector/matrix operations and solving systems of linear equations;
- Programming in MATLAB (m-files, functions, loops and conditional statements);
- Basic numerical algorithms (solution of non-linear equations, numerical integration, interpolation and differentiation);
- Applications including Markov processes and differential equations.

Text: There will be no specific text. Some notes, Maple scripts and MATLAB files will be posted online.

Assessment: Weekly assignments (20%), weekly lab quizzes (3% each, total 30%), two midterms (10% each, total 20%), final exam (30%). Unlike some previous years, the midterms and final exam will *not* be held in the computer lab. Midterm Dates: Monday January 28 and Monday, March 11.

Assignments: Homework will be assigned every Friday, due the following Friday. There will be some written questions and some questions to be done with Maple or MATLAB. Solutions will be posted Friday afternoon on the due date. No late assignments will be accepted after solutions are posted. The lowest homework score will be omitted.

Lab Quizzes: Lab quizzes will take place every Tuesday during the lab hour. They will be based on material on the homework handed in on the previous Friday. The lowest lab quiz score will also be omitted.