

320. Computer Methods in Mathematical Science I. *Fall 2013 Syllabus*

Professor: Robert Strain (strain at math.upenn.edu)

Course Web Page: <http://www.math.upenn.edu/~strain/13ma320/>

Class schedule: MWF @ 2:00 - 3:00PM in DRL A5.

First class, last class: August 28, December 9.

Brief course description: Students in this class will write programs in MATLAB to solve mathematical problems numerically (rather than looking for elusive exact solutions). We will computationally explore numerical quadratures, equation-solving, linear algebra and differential equations. We further engage in error analysis and critical comparisons of methods.

Prerequisites: MATH 240 or concurrent and ability to learn to program in MATLAB, or my permission.

Homework: Weekly, posted on the courses Canvas website. You will be allowed one week to complete each assignment. Collaboration between students is encouraged, but you must write your own solutions, understand them and give credit to your collaborators. (To be precise, put a list of the students with whom you collaborated on your homework.)

Late homework will not be accepted.

Your lowest homework score will be dropped.

Exams: There will be two in class exams to be weighted equally; one in the middle of the semester and the other at the end of the semester. Students will not be allowed to make use of outside material during the exams. The exams will not involve programming.

Grading: Your final grade is based on your level of participation in class (10%), the homework (50%), as well as the in class exams (20% and 20%).

Programming: We will use MATLAB in this class. We will start from the basics, so you do not need prior experience. However, programming will be a significant part of the work done in this class. Octave should also be an acceptable alternative.

Textbooks: Jeffrey Leaders “Numerical Analysis and Scientific Computation.” This book is required in the sense that I will teach from it and assign homework problems from it in this class.

Stormy Attaways “Matlab: A Practical Introduction to Programming and Problem Solving.” This book is recommended to those students who do not have a background programming in MATLAB.

Canvas: The class will make use of Canvas to post assignments, grades, announcements, etc. You will be responsible for checking the class Canvas regularly during the semester.