

MATH 708 (Foundations of Computational Mathematics), Fall 2014

Meeting Information:

Classroom Location: LC 405

Days and Times: MWF 1:10PM–2:00PM

Instructor Information

Xinfeng Liu

Email: xfliu@math.sc.edu

Phone: 576-5849

Office Location: LC 422

Office Hours: MW 10:00AM–11:30AM or by prior appointment

Course Homepage: people.math.sc.edu/xfliu/teaching/Fall2014/math708/math708.htm

Textbook

1: Numerical Mathematics and Computing, 7th Edition, by Ward Cheney and David Kincaid.

2: An Introduction to Numerical Analysis, by Endre Suli and David Mayers.

Prerequisites

Math 554 or equivalent upper level undergraduate course in real analysis.

Subject Materials

This course will tentatively cover the topics that include approximation of functions by algebraic polynomials, splines, and trigonometric polynomials; numerical differentiation; numerical integration; orthogonal polynomials and Gaussian quadrature; numerical solution of nonlinear systems, unconstrained optimization. One of the basic objectives of this course is to acquaint students of science and engineering with capabilities of using computers for solving numerical problems that arise in their professions. Another objective is to provide students an opportunity to hone their skills in computer programming and problem solving.

Homework

Homework will be assigned, and will be collected regularly (generally on Wednesdays). Late homework will not be accepted, and no make-ups for missing homework. Details about this will be given as appropriate. One lowest homework will be dropped for the final grade calculation.

Exams

There will be two midterm exams and a comprehensive final exam. The exams are “closed book”: no books, no notes, no calculators, no laptop computer or equivalent technology, etc. There are no early exams. A late

exam is only possible for a written legitimate documented reason. Note that student athletes, participating in a USC athletic event and with appropriate documentation, are exempt from this rule. You must take your exams with the lecture for which you are registered.

Grades

Homework (25%) (one lowest homework will be dropped)

Exam 1 (20%), Wednesday, September 24, 2014

Exam 2 (20%), Wednesday, October 22, 2014

Final (35%), Monday, December 8, 2014

The deadline to drop this course without a grade of WF is **Thursday, October 9, 2014**. The dates and materials for two mid-term exams are tentative and subject to change as announced in class.

Reading

Reading the reference textbooks **in advance** of the lecture is strongly encouraged. Benefits of this preparation include obtaining a familiarity with the terminology and concepts that will be encountered (so you can distinguish major points from side issues), being able to formulate questions about the parts of the presentation that you do not understand, and having a chance to review the skills and techniques that will be needed to apply the new concepts.

Learning Outcome

Students will master mathematical algorithms and programming skills with sufficient knowledge of applying numerical algorithms to solve a great variety of problems that arise from physical/engineering sciences. In addition, the students are also expected to be prepared to evaluate and judge the accuracy of the numerical results with computer algorithms.

Attendance

Attendance at every class meeting is important - and expected. Students missing more than 10% of the class meetings (4 days) can have their grade lowered.

Cell Phone and Computer Policy

Please remember to turn off or silence your cell phone prior to class. No texting allowed during class. Computers can only be used to make notes during class, and playing computer games during class is not tolerated.

Academic Dishonesty

Cheating and plagiarism in any form is not tolerated. If a student is caught cheating, I will follow the guidelines as set forth in the USC Honor Code and other University guidelines.