MATH 726 – Numerical Analysis I

Instructor Professor Doug Meade
Office Hours: MW 10:00–11:00, and by *prior* appointment
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WWW URL `http://www.math.sc.edu/~meade/math726-S96/`

Meeting Times MWF 9:05AM– 9:55AM, LC 401A

Text Ciarlet, *Introduction to numerical analysis and optimisation*, Cambridge Univ Press, 1995
Golub and VanLoan, *Matrix computations*, (2nd edition), Johns Hopkins Univ Press, 1989

Prerequisite Completion of MATH 554 (Analysis I). A (graduate-level) background in linear algebra and a familiarity with general concepts and techniques from real analysis will be assumed.

Course Content This is the first semester of a two-semester sequence in graduate-level numerical analysis. The primary content of this course is numerical linear algebra. Both theoretical and computational issues will be addressed.

Specific topics will include matrix algebra, numerical matrix algebra, singular value decomposition, and eigenvalue computation. Applications will typically be taken from differential equations, including both finite differences and finite elements.

The course will generally follow the presentation in chapters 1–5, 7, and 8 in Golub and VanLoan. The Ciarlet text will provide both more in-depth development of the theory and applications. At the end of this course, students will have been exposed to the theory, application, and implementation to many of the fundamental issues that arise in scientific computing.

Computer Usage Accounts on the Mathematics network will be provided to all students in this course. You may use any computational resource for your work in this course. Computer work will involve the use of both MATLAB and Maple. While students are assumed to have some familiarity with computers, no prior knowledge of either software package will be assumed. The amount of computational work will depend, to a degree, on student interest and background.

Grading Your grade in this course will be based on the successful completion of the homework and a final exam. The final exam will be given at 9:00A.M. on Saturday, April 27, 1996.

Note that the deadline to drop this course without a grade of W is Friday, February 16, 1996.

Homework Problems will be assigned on a regular basis. You are expected to successfully complete all assigned problems. While you may choose to discuss these problems with others in the course, your final solution must be the prepared without consultation with any other human (except me). If your solution is based on a result found in another source, please provide a full reference.

Academic Honesty Cheating and plagiarism will not be tolerated in this course. You may discuss homework problems with others, but do not copy solutions from another student or from a book. Violations of this policy will be dealt with in a matter consistent with University guidelines.