MATH 709, Computational Mathematics II, Spring 2018

Meeting Information:

- Classroom Location: LC 101

- Days and Times: *TTH 2:50pm–4:05pm*

Course webpage
type "www.math.sc.edu/~xfyang", click on Teaching.
Information
Professor. Xiaofeng Yang
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Phone: 803-777-3776
Office Location: LC 317c
Office Hours: TTH 12:00pm–1:30pm or by appointment
Textbook:
Lloyd N. Trefethen and David Bau III, "Numerical Linear Algebra", Siam, Philadelphia, 1997.

Other references:

- James Demmel, Applied Numerical Linear Algebra, Siam, Philadelphia, 1997.

- Gene H. Golub and Charles F. Van Loan, Matrix Computations, The Johns Hopkins University Press, Baltimore, 1988.

- Roger A. Horn and Charles R. Johnson, Matrix Analysis, Cambridge University Press, 1985.

- The Math Works Inc., The student edition of MATLAB. Users Guide, Prentice Hall, Englewood Cliffs, 1995.

Course objectives (learning outcomes)
This course is the second half of a two semester sequence on computational mathematics. It is a mathematical approach to numerical analysis and practice of numerically solving applied linear algebra problems which frequently arises in the physical sciences, particularly from the discretization of partial differential equations. Also included is a treatment of systems of ordinary differential equations.

Eligibility and Prerequisites

- Math 544 OR 526, OR Equivalent upper level undergraduate courses in linear algebra.

- The level of material is intended for beginning graduate students in mathematics, physics, computer sciences, or other physical sciences. Exceptional undergraduate students are also encouraged to enroll.

Homework and Quizzes

Grades will be based on the quality of homework, programming assignments, and a final exam. *Homework will be available every week on the course website.* Approximate percentages will be 40%-30%-30% for homework-programming-final. It is expected that each student in this class conduct himself/herself within the guidelines of the Honor System. All academic work should be done with the level of honesty and integrity that this University demands. Letter grades will be assigned based on the following numerical scales:

[90,100] A, [86, 89] B+, [80, 85] B, [76, 79] C+, [70, 75] C, [66, 69] D+, [60, 65] D, [0, 59] F. (The dates are to be determined.)

Exams

There will be only a comprehensive final exam. It is "closed book" with no books, no notes, no graphing calculators, no Labtop computer or equivalent technology, etc. You may use the scientific calculator. Picture I.D. is required and must be presented upon request. 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 (40%)
Programming project (30%)
Final Exam (30%)

Tentative sections covered

Topics will include materials from Chapters 1-6 of the textbook and related references encompassing direct and iterative solutions of linear systems, linear least square problems, symmetric and non-symmetric Eigenvalue problems, singular value decomposition, and solution methods for system of ordinary differential equations.

Programming experiences

Familiarity with structured programming will be assumed. Extensive use MATLAB, Fortran, C or C++, etc. will be required in doing computer lab assignments.

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.

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.

American disability act

Students with disabilities needing academic accommodations should: (1) register with and provide documentation to the Student Disability Services (SDS); (2) bring

a letter to the instructor from SDS indicating you need academic accommodation. This should be done within the first week of class.

Academic honor code

The Academic Honor System of The University of South Carolina is based on the premise that each student has the responsibility (1) to uphold the highest standards of academic integrity in the students work, (2) to refuse to tolerate violations of academic integrity in the University community, and (3) to foster a high sense of integrity and social responsibility on the part of the University community.