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
Email: xfyang@math.sc.edu
Phone: 803-777-3776
Office Location: LC 317c
Office Hours: TTH 12:00pm–1:30pm or by appointment

Textbook:


Other references:


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 Laptop 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.
Mathematics of Computation (MATH COMPUT). Publisher: American Mathematical Society. Journal description. This journal is devoted to research articles of the highest quality in computational mathematics. Areas covered include numerical analysis, computational discrete mathematics, including number theory, algebra and combinatorics, and related fields such as stochastic numerical methods. Additional details. Cited half-life. There are two media for homework in Math for Economics II. There will be assignments administered through WebAssign (This is why a WebAssign software license is one of the required course materials which you can purchase online or you can purchase it from the bookstore). WebAssign problems are computational in nature and assess the mathematical techniques introduced in class. You will get immediate feedback on your progress and will get several chances to ensure it. WebAssign will be available directly through the course’s NYU Classes website (available at your home.nyu.edu account) once the Calculations are based on Scopus. SCOPE. Computational Mathematics and Mathematical Physics is a monthly journal published in collaboration with the Russian Academy of Sciences. The journal includes reviews and original papers on computational mathematics, computational methods of mathematical physics, informatics, and other mathematical sciences. The journal welcomes reviews and original articles from all countries in the English or Russian language. READERSHIP. Specialists in numerical analysis, applied mathematics, mathematical modeling, theory of optimization, discrete mathematics and info Computational Mathematics and Modeling focuses on important Russian contributions to computational mathematics that are useful to the applied scientist or engineer. This quarterly publication presents timely research articles by scientists from Moscow State University, an institution recognized worldwide for influential contributions to this subject. This indicator counts the number of citations received by documents from a journal and divides them by the total number of documents published in that journal. The chart shows the evolution of the average number of times documents published in a journal in the past two, three and four years have been cited in the current year. The two years line is equivalent to journal impact factor â“¢ (Thomson Reuters) metric. Cites per document. Year. Computational mathematics is a field closely connected with a variety of other mathematical branches, as for often times a better mathematical understanding of the problem leads to innovative numerical techniques. Duke’s Mathematics Department has a large group of mathematicians whose research involves scientific computing, numerical analysis, machine learning, computational topology, and algorithmic algebraic geometry. The computational mathematics research of our faculty has applications in data analysis and signal processing, fluid and solid mechanics, electronic structure theory, biol