

**MATH 708, Computational Mathematics I, Fall 2017**

**Meeting Information:**

- Classroom Location: LC 303B
- Days and Times: TTH 1:15pm–2:30pm
- [\[Link for the Course webpage\]](#)

**Information**

Associate Professor Xiaofeng Yang

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Phone: 803-777-3776

Office Location: LC 317c

Office Hours: TTH 10:30am-11:30am and 2:30PM-3:00PM or by appointment

**Course Reference Textbook:**

1. An introduction to numerical analysis, by Endre Suli and David Mayers;
2. Numerical Mathematics and Computing, 7th Edition, by Ward Cheney and David Kincaid.

**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 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. Students are expected to master mathematical algorithms and programming skills, and apply numerical algorithms that they learn from this course to solve a great variety of problems arising 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.

### 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 20%-20%-20%-40% for homework-Midterms-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 two midterm exams and one 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 (20%)**

**Two midterms (20% for each)**

**Final Exam (40%)**

### 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.