

MATH 417: Numerical Analysis

Instructor: Prof. Guido Kanschat
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Office hours: Mondays, Wednesdays, 2:00pm–3:30pm

Lecture: Mondays, Wednesdays, Fridays, 11:30am–12:20pm
Blocker Bldg., Room 163

Teaching Assistant: Yan Li

Lab: Thursdays, 11:10am–12noon
Blocker Bldg., Room 130

Textbook

R. D. Burden, J. D. Faires: Numerical Analysis, 8th edition; Brooks & Cole Publishing Co., 2004.

Prerequisites

Prerequisites: MATH 222, 304 or 311; MATH 308 or equivalent; ability to program in C/C++ (preferred) or Matlab or Fortran.

Course Outline and Schedule

The course introduces concepts of numerical mathematics such as round-off and discretization errors, iterations and stability. These will be studied in conjunction with solution techniques for common problems in mathematics, science and engineering. We will study a selection from the textbook according to this schedule:

Chapter 1 (Mathematical Preliminaries and Error Analysis)	1 week
Chapter 2 (Solutions of Equations in One Variable)	2 1/2 weeks
Chapter 6 (Direct Methods for Solving Linear Systems)	3 weeks
Chapter 3 (Interpolation and Polynomial Approximation)	2 1/2 weeks
Chapter 4 (Numerical Differentiation and Integration)	2 1/2 weeks
Chapter 5 (Initial-Value Problems for Ordinary Differential Equations)	3 weeks

Programming Assignments

Programs should be written either in C/C++, Fortran or Matlab; users of other languages should discuss this with me before handing in assignments.

Matlab users are restricted to the basic arithmetic operations and standard mathematical functions like sine, exponential, logarithm and to standard programming constructs such as conditionals and loops. For example, if programming a matrix inversion is requested, you should not simply call the `invert()` function. Deviations from this rule may be stated on the assignment.

Program text must be structured in a way that it is clear and well readable.

Webpage + Support

Homework assignments and other course information will be posted at the course webpage

<http://www.math.tamu.edu/~kanschat/teaching/>

If you feel you need help, do not hesitate to ask your teaching assistant or come to my office hours; I will also offer appointments if your class schedule does not allow you to see me during office hours.

I will answer email questions, usually within 24 hours on weekdays. Depending on the complexity, a personal appointment might be necessary.

Exams + Grading

Final course grades will be computed from homework and programming assignments (50%) and exams (50%).

One midterm exam (10/20/2006 during class hour, 17%) and one comprehensive final exam (12/13/2006, 10:30am to 12:30pm, 33%).

Make-up exams: Students must make arrangements in advance if they will not be handing in homework on time or will miss an exam. Absences due to recognized University-related activities, religious holidays, verifiable illness, and family/medical emergencies will be dealt with on an individual basis, but require a written excuse. Please let your instructor know about this as soon as possible, and preferably in advance.

Incompletes: I will consider giving an incomplete if you have successfully completed all but a small portion of the work of the course, and are prevented from completing the course by a severe, unexpected event. Simply being behind work is not a reason for an Incomplete. In that case you should consider dropping the course.

S/U grades: If you are registered S/U your grade will be 'S' if your letter grade is C or above, and 'U' otherwise.

Policies

Academic integrity: The Aggie Honor Code "An Aggie does not lie, cheat or steal, or tolerate those who do" applies, see also the Honor Council Rules and Procedures at

<http://www.tamu.edu/aggiehonor.html>

Students are strongly encouraged to work together and discuss homework problems with each other. However, copying or stealing work done by others is an act of academic dishonesty and will be persecuted according to the University policy.

Disabilities: If you have a disability and need special assistance, please contact me so we can make accommodations. The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please also contact Services for Students with Disabilities, Koldus 126, 845-1637.

For other policies and other information, please read

<http://www.math.tamu.edu/teaching/operationspg.html>