Introduction to Numerical Methods II
Math 5486, 4 credits, Spring 2017

Instructor: Brittan Farmer
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Meeting Location/Time: Mon, Wed, Fri 1:25 pm – 2:15 pm (Vincent Hall 1)

Office Hours: Tues 1:30 pm – 2:30pm; Wed 2:25 pm – 3:25 pm; Fri 10:00 am – 11:00 am; or by appointment (329 Vincent Hall)

Course Description: This course is the second in a two-semester sequence on numerical approximation algorithms for different types of mathematical problems. We will learn how these algorithms are derived and analyze how well they work. This semester, we will consider

- methods to solve linear systems,
- iterative techniques in linear algebra,
- approximation theory,
- numerical solutions of nonlinear systems,
- boundary value problems for ordinary differential equations, and
- some topics on numerical solutions of partial differential equations.

Prerequisites: This course assumes knowledge of single and multivariable calculus, linear algebra, and differential equations, and familiarity with some programming language.

Text: Numerical Analysis by Burden, Faires, and Burden, 10th Edition, published by Cengage. We will cover (approximately) Sections 6.1 – 6.6; 7.1 – 7.5; 8.1, 8.2, 8.5, 8.6; 10.1 – 10.4; 11.1 – 11.4; and 12.1, 12.4. You may use an older edition if you like (8th or 9th edition), but be careful with the numbering of sections and exercises. To mitigate confusion, I will include the full text of the problem in all homework assignments.

Software: We will be using MATLAB for examples and exercises in this class. This software is available on the computers in Vincent Hall and in CSE labs. Additionally, students can download the software for their personal computers at http://cselabs.umn.edu/software/downloadable_software. If you are not a CSE student, you will need to create a CSE lab account here: https://www.cs.umn.edu/account-management/.

Course Web Sites: The course has a Moodle page with the syllabus, the homework assignments, and other important information. https://ay16.moodle.umn.edu/course/view.php?id=13303

We will be using Piazza for class discussion. Rather than emailing questions to the instructor, students are encouraged to post their questions on Piazza. There you can
receive responses from other students as well as from the instructor. Find our class page at: https://piazza.com/umn/spring2017/math5486/home

Class Policies and Expectations:
Quizzes and exams are closed book.
Scientific and graphing calculators may be used during quizzes and exams. Laptops may not be used during quizzes or exams, and cell phones are not to be used in class at any time.
Make-up quizzes and exams are possible in the case of exceptional, documented circumstances. Please see http://policy.umn.edu/education/makeupwork.
Cheating and plagiarism are unacceptable. Cases of academic dishonesty will be referred to OSCAI. Students should be familiar with the Student Conduct Code (https://oscai.umn.edu), student responsibilities (http://policy.umn.edu/education/studentresp), and other standard policies (http://www.sos.umn.edu/Staff-Fac/Syllabus.html).

Homework: Homework assignments will be assigned every other week. You may discuss the homework problems with your peers, but the solutions you turn in must be in your own words. If you worked with other students on a problem, please cite their contribution. Homework must be turned in by the beginning of class on the due date. Late homework will not be accepted. The lowest homework grade will be dropped.

Quizzes: On weeks when homework is not due, there will be short quizzes, either in-class or take-home. The lowest quiz grade will be dropped.

Exams:
First Exam Friday, February 17 in class
Second Exam Friday, March 31 in class
Final Exam Wednesday, May 10 1:30 pm – 3:30 pm
Dates for the exams are fixed. Make plans now to be certain these dates are in your calendar. Note that travel is not a sufficient excuse to have an exam scheduled on a different day.

Grading Policy:
Homework 20%
Quizzes 10%
First Exam 20%
Second Exam 20%
Final Exam 30%

Accomodations for Students with Disabilities: Any student with a documented disability should contact me as soon as possible so that we can discuss arrangements to fit your needs.