MATH 5600 Section 1:
Survey of Numerical Analysis
Spring 2019

Instructor: Timo Heister (heister@math.utah.edu)
Homepage: http://www.sci.utah.edu/~heister/
Office: WEB 3608
Office Hours: TBA (see homepage for updates to my office hours).

Class Time and Location: MTWF 10:45 – 11:35 in WBB 207
Course Information: This is a 4-credit course.

Course Description:
Numerical linear algebra, interpolation, integration, differentiation, approximation, initial- and boundary-value problems of ordinary and partial differential equations.
Programming experience is necessary prior to taking this course.

Learning objectives:
Upon successful completion of this course, a student will be able to:
1. Understand, analyze, and implement algorithms for different numerical problems
2. Understand round-off error and its consequences in computing.
3. Master algorithms for solving nonlinear equations.
4. Solve linear systems with direct and iterative methods, understand convergence and preconditioners.
5. Solving least square problems.
6. Understand the power method to find the eigenvalues
7. Interpolate functions.
8. Approximate derivatives with finite difference methods and quantify the error.
9. Approximate definite integrals with numerical methods and quantify the error.
10. Solve ordinary differential equations with timestepping methods and quantify errors.

Prerequisites:
Calculus (2210 or 1260 or 1280 or 1321 or 3140) and Diff Equ & Lin Algebra (2250 or 2270)

Text:
No required text book. I will provide typed notes for the majority of the lectures as a courtesy.

Homework:
Problem sets will be announced in-class and subsequently posted on the course website. The problems will be a mixture of problems solved by hand and programming assignments. Late assignments of any form will not be accepted without either prior approval from the instructor.

Each homework assignment is worth equal weight, and over the course of the semester, your lowest homework score will be dropped.

Homework will be done in teams of size two. I do not allow larger groups and I expect the work to be done as a team. Please only submit one copy per team and include both names.

Exams:
This course will have two in-class midterm exams and one take-home final exam. Details about the final will be announced later in the semester.

Unless otherwise specified, neither calculators nor notes of any kind are allowed on any of the exams.

Grading:
Your course grade will be computed as follows:
Homework   30%
Midterm exam: 2x25%
Final exam: 20%

Final letter grades will be assigned based on the following scheme:
- 92% - 100% — A
- 90% - 91% — A−
- 88% - 89% — B+
- 82% - 87% — B
- 80% - 81% — B−
- 78% - 79% — C+
- 72% - 77% — C
- 70% - 71% — C−
- 68% - 69% — D+
- 62% - 67% — D
- 60% - 61% — D−
- 0% - 59% — E

Attendance:
– Students are allowed two unexcused absences during the semester. More than two unexcused absences may result in a student being dropped from the course.

- Attendance at scheduled class tests and exams is mandatory, unless prior consent has been given by the instructor.

Class communication:
Class communication will be done through canvas and emails will go to your University of Utah email address. I will send a welcome message before the first day of class. If you do not receive this message, get into contact with me as soon as possible.

ADA Statement:
The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

Student responsibilities and integrity:
All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, and I will do so, beginning with verbal warnings and progressing to dismissal from and class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee.
http://regulations.utah.edu/academics/6-400.php