SYLLABUS SPRING 2023
The University of Iowa
The College of Liberal Arts and Sciences
Department of Mathematics
Numerical Methods II -- MATH:5810
Sections 0AAA and 0A01
Lecture meets 9:30-10:20 MWF 210 MLH
Discussion meets 9:30-10:20 Th 71 SH

Course is cross-listed with CS:5720
Website address: http://icon.uiowa.edu

Some of the policies relating to this course (such as the drop deadline) are governed by its administrative home, the College of Liberal Arts and Sciences, 120 Schaeffer Hall.

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Description of Course:
This course will consist of seven modules covering
1) direct methods for linear systems (Sec. 2.1 of Stewart)
2) sparse matrices (Sec. 2.3 of Stewart) and least squares problems (Sec. 2.2 of Stewart)
3) iterative methods for linear systems (Sec. 2.4 of Stewart)
4) methods for eigenvalues and eigenvectors (Sec. 2.5 of Stewart)
5) methods for initial value problems (Sec. 6.1 of Stewart)
6) methods for boundary value problems (Sec. 6.2 and Sec. 6.3.1 of Stewart)
7) methods for partial differential equations (Secs. 6.3.2 to 6.3.4 and Sec. 6.4 of Stewart)

This course will be a mix of theory and computer application.

Objectives and Goals of the Course:
The aim of this course is to teach students how to derive, analyze and implement numerical methods for solving mathematical problems. This course plan may be modified during the semester. Such modifications will be announced in advance during class periods; the student is responsible for keeping abreast of such changes.
**Texts:**
Required texts or materials: *Numerical Analysis: A Graduate Course*, David E. Stewart.

**Grading System and the Use of +/-:**
Letter grades with +/- will be used. Percentage brackets for these letter grades will be based on the specific point distribution of student scores in the class.

**Assignments and Percentage of Final Grade:**
Homework assignments will consist of theoretical problems and computer problems. Homework in total will be worth 35% of the grade for the course (i.e., each module will be worth 5%). Assignments will be posted on ICON near completion of the lectures covering a given module and will be due one week after the lectures on that module are concluded.

**Exams and Percentage of Final Grade:**
Midterm: 25% (one exam)
Final exam: 40%

**A Word about the Date and Time of the Final Exam:**
The date and time of every final examination is announced by the Registrar generally by the fifth day of classes. **No exams of any kind are allowed during the last week of classes.** All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar’s web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of the final exam.

**Course Policies:**
Course attendance: *There is no formal attendance requirement. However, not attending lectures will put you at a significant disadvantage.*
Participation in class discussions: *You may be called upon from time to time during the course.*
Timely completion of assignments: *Late assignments will only be accepted with a documented excuse.*

**Student Collaboration:**
The homework modules for this course are designed to help you master your knowledge related to the topics covered during lecture. As such, you may work on the homework problems with others or use online resources, but must write up the solutions yourself, including your own computer code when applicable.

**Other Expectations of Student Performance:**
*You are expected to engage in civil behavior at all times during this course. Failure to do so may result in being asked to leave the lecture.*

**Calendar of Course Assignments and Exams:**
• Module homework assignments will be posted on ICON near the end of the lectures for that module. The due dates will be posted along with the assignment; you will be given at least one week after the last lecture for that module to complete the assignment.

• The midterm exam will be in class during normally scheduled lecture class time on Friday, March 24, 2022.

• As mentioned above, the final exam will be announced later in the course.

University Policies:
https://provost.uiowa.edu/teaching-resources/course-syllabi-information

Accommodations for Students with Disabilities
Basic Needs and Support for Students
Classroom Expectations
Exam Make-up Owing to Absence
Free Speech and Expression
Mental Health
Military Service Obligations
Non-discrimination
Religious Holy Days
Sexual Harassment/Misconduct and Supportive Measures
Sharing of Class Recordings