Syllabus Math 4364: Introduction to Numerical Analysis in Scientific Computing

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The information contained in this course syllabus is subject to change. Students will be informed of possible changes during the course.
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Course and Contact Details:
Course Number: 4364-02 (20284)
Term: Spring 2023
Course Name: Introduction to Numerical Analysis in Scientific Computing
Instructor: Dr. Loic Cappanera
Email: lmcappan@central.uh.edu
Office: PGH 602

Lecture times: Tuesday and Thursday 8:30am-10:00am in room SEC 205

Remark: lecture of Thursday March 9th will be held online asynchronously, meaning that a video of a lecture will be uploaded on MS Teams.

Online Materials: Some materials (lecture notes, syllabus, assignments, exams sample, Matlab codes) will be shared with students on Microsoft Teams. Please do not try to contact the instructor via Blackboard or MS Teams. Only email communications will be answered.

Office hours (PGH 602):
Monday 10:30am-11:30am and Thursday 2:00pm-3:00pm
by appointment (send an email to instructor to confirm availability).

Tutoring session:
TA: Lingling Chen
Time: Tuesday 1-3pm

Remark: Students can also ask question to TA during in other tutoring session on Wednesday 10:30am-12:30pm. If no students join the session in the first 15 minutes, the tutoring session will be canceled.
Required Textbook:

Learning Objectives and Lectures Topics: The following topics will be covered in class:

- Mathematical Preliminaries and Error Analysis (sections 1.1 to 1.3)
- Solutions of Equations in One Variable (sections 2.1 to 2.4)
- Interpolation and Polynomial Approximation (sections 3.1, 3.5 and 3.5)
- Numerical Differentiation and Integration (sections 4.1, 4.3, and 4.4)
- Initial-Value Problems for Differential Equations (sections 5.1 to 5.4, 5.9, 5.11)
- Direct Methods for Solving Linear Systems (sections 6.1-6.2 and 6.5-6.6)

If time permit, we will also cover sections 3.6, 4.7, 4.8, and 5.6.

Prerequisites: Math 3331 or MATH 3321. Ability to do computer assignments with Matlab.

Assessment: Your final grade will be based on:

(25) 25 points for homeworks. A random selection of homework problems will be graded from among those assigned.

(50) 25 points for each of two midterms.

(25) 25 points for a final exam scheduled on Thursday 11th May, 8:30am-10:30am in SEC 205.

Remarks on assignments:

- There will be around 7 assignments/homeworks.
- Some assignments requires to run program/code in Matlab (most programs will be made available by the instructor).
- The assignments and their due dates will be posted on Blackboard and sent by email.
- Assignment should be submitted via Blackboard as one pdf file.
- No email submissions will be accepted. There are no unjustified extensions.
COVID-19 Information: Students are encouraged to visit the University’s COVID-19 website for important information including diagnosis and symptom protocols, testing, vaccine information, and post-exposure guidance. Please check the website throughout the semester for updates. Consult the (select: Undergraduate Excused Absence Policy or Graduate Excused Absence Policy) for information regarding excused absences due to medical reasons.

Reasonable Academic Adjustments/Auxiliary Aid: The University of Houston complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for disabled students. In accordance with Section 504 and ADA guidelines, UH strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please contact the Justin Dart Jr. Student Accessibility Center (formerly the Justin Dart, Jr. Center for Students with DisABILITIES).

Excused Absence Policy: Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston Undergraduate Excused Absence Policy and Graduate Excused Absence Policy for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to military service, religious holy days, pregnancy and related conditions, and disability.

Recording of Class: Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the Justin Dart, Jr. Student Accessibility Center. If you have an accommodation to record class-related activities, those
recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor’s recordings for their own studying and note-taking. Instructor’s recordings are not authorized to be shared with anyone without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

**UH Email:** Please check and use your Cougarnet email for communications related to this course. To access this email, login to your Microsoft 365 account with your Cougarnet credentials.

**Academic Honesty Policy:** High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The UH Academic Honesty Policy is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

**Title IX/Sexual Misconduct:** Per the UHS Sexual Misconduct Policy, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office. Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the Title IX website at https://uh.edu/equal-opportunity/title-ix-sexual-misconduct/resources/.

**Security Escorts and Cougar Ride:** UHPD continually works with the University community to make the campus a safe place to learn, work, and live. Our Security escort service is designed for the community members who have safety concerns and would like to have a Security Officer walk with them, for their safety, as they make their way across campus. Based on availability either a UHPD Security Officer or Police Officer will escort students, faculty, and staff to locations beginning and ending on campus. If you feel that you need a Security Officer to walk with you for your safety please call 713-743-3333. Arrangements may be made for special needs. Parking and Transportation Services also offers a late-night, on-demand shuttle service called Cougar Ride that provides rides to and from all on-campus shuttle stops, as well as
the MD Anderson Library, Cougar Village/Moody Towers and the UH Technology Bridge. Rides can be requested through the UH Go app. Days and hours of operation can be found at https://uh.edu/af-university-services/parking/cougar-ride/.