

Online Math 4364 and 5344 – Spring 2022

Introduction to Numerical Analysis

Instructor: Dr. Jeff Morgan, jjmorgan@uh.edu.

Office Hours: By appointment.

Course Homepage: This course will use the Space LMS. **After 1/10/2022**, go to <https://www.space.uh.edu>, create an account, and access the course.

Textbook: None required.

Suggested Resources:

- Numerical Analysis (9th edition), by R.L. Burden and J.D. Faires, Brooks-Cole Publishers, 9780538733519.
- Numerical Methods: An Inquiry Based Approach with Python, by Eric Sullivan, Independently Published and Available on Amazon, ISBN-13: 979-8687369954.
- Numerical Python: Scientific Computing and Data Science Applications with Numpy, SciPy and Matplotlib 2nd ed. Edition, by Robert Johansson, Apress Publishing, ISBN-10: 1484242459.

Prerequisites: Math 3331 or 3321 or equivalent, and three additional hours of 3000-4000 level mathematics (2018-2019 catalog).

Course Overview: The students in this online section will be introduced to topics in scientific computing, including numerical solutions to nonlinear scalar equations, numerical differentiation and integration, Richardson extrapolation, numerical solutions to linear and nonlinear systems of equations, numerical optimization, numerical solutions to initial value problems and boundary value problems, and numerical solutions to boundary value problems for elliptic PDEs. Computations in this course can be done using Matlab, Julia, Python, Java, C++ or VBA. There will be tutorials associated with the use of Python and Excel. Students using Julia, Matlab, Java or C++ can receive assistance upon request. Students who decide to use Excel are expected to have access and basic familiarity with Excel, but they are not expected to know advanced spreadsheet functionality or have programming experience with VBA. All UH students get free access to Matlab and Excel. Downloads for Python, Julia, Java and C++ are freely available online. Students will not be tested over Excel/VBA, Matlab, Julia, Python, etc. but it will be necessary to use these types of tools to complete many of the problems in the assignments. The Midterm and Final Exams will each be two hour written exams, where students will be expected to demonstrate their understanding of the fundamental concepts. The Final Exam will be comprehensive.

Live Online Meetings: The class will have **optional** live online meetings on Tuesday evenings from 8-10:00pm, **starting week 2**. Students are strongly encouraged to attend the live online sessions. Notes and a video of the session will be posted for students who cannot attend.

Discussion Board Activity: All students are expected to discuss the course material via the discussion board. 10% of the final grade will be based upon discussion board activity. Discussion board grades will be given every 2 weeks, based upon posts from the previous 2 weeks. I typically give one point for each question and attempted answer (whether right or wrong) associated with the course. Some posts will not

receive credit if they are simply restating something that has been repeatedly posted before. Students need to accumulate 10 points every 2 weeks to get a perfect score. I grade the posts as I read them.

DO NOT POST SOLUTIONS TO ASSIGNMENT OR FITB QUESTIONS.

No Discussion Board grades will be dropped, and points from earlier two-week periods cannot be carried forward.

Additional Communication: Students will receive emails from me during most weekdays of the course, reminding them about current material, upcoming topics, reading assignments, available help materials, and coming due dates. These emails will also be posted in a special thread within the discussion forum. Email can also be used to communicate with me, although students are encouraged to use the discussion forum when the questions are not of a student specific nature.

Electronic Homework: FITB (Fill In The Blank) electronic homework will be given on odd weeks during the semester. Students can continue to submit answers after the due dates, but they will only receive 80% credit for correct answers that are late. **No FITB grades will be dropped.**

Written Assignments: Written Assignments will be given on even weeks during the semester. Students will submit their written homework by scanning and uploading their work as pdf documents. Additional instructions will be given. **One Written Assignment will be dropped** (the one with the lowest grade).

Weekly Videos and Notes: Videos and notes will be posted each week, discussing the current course material. Students will need to read the text, in addition to viewing these materials.

Exams: A proctored midterm and final exam will be given on the UH campus. We will work with students who are not in the Houston area to accommodate proctored testing (see the “Proctored Exams” section below). The dates and times of the exams will be announced by the end of the first week of the semester.

Grades:

Students enrolled in Math 5344 will be held to a higher standard than students enrolled in Math 4364.

Discussion Board Activity – 10%

FITBs - 15%

Written Homework - 15%

Midterm - 30%

Final Exam – 30%

Important Note: Students must score at least 50% on the final exam to pass the course (which will not be a problem for anyone keeping up and doing their own work in the course).

90% and above - A

at least 80% and below 90% - B

at least 70% and below 80% - C

at least 60% and below 70% - D

below 60% - F

Whenever possible, and in accordance with 504/ADA guidelines, we will attempt to provide reasonable academic accommodations to students who request and require them.

Proctored Exams: Students in this course will take a proctored midterm exam and a proctored final exam. If you live outside the Houston area, then the University of Houston's Online & Special Programs (OSP) office can facilitate proctoring services in your area. Otherwise, you will take your exams on the University of Houston campus. For students outside the Houston area, information about proctoring and how to submit a proctoring request form can be found on the Proctoring Services page,

<http://www.uh.edu/online/students/proctoring-students.php>

Prior to submitting a request, students should read and understand the proctoring processes and requirements. Questions or concerns about proctoring services can be directed to the OSP office at 713-743-3327 or proctoring@uh.edu. Hours of operation are Monday-Friday, 8:00 a.m.- 5:00 p.m., except for University holidays.

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 [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. 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 Center for Students with DisABILITIES. 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 notetaking. 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.

Syllabus Changes: Due to the changing nature of the COVID-19 pandemic, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible through the course homepage on Space.

Resources for Online Learning : The University of Houston is committed to student success, and provides information to optimize the online learning experience through our website at <https://uh.edu/power-on>. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet and AccessUH, requesting a laptop through the Laptop Loaner Program, using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact UHOnline@uh.edu.

UH Email: Email communications related to this course will be sent to your [Exchange email account](#) which each University of Houston student receives. The Exchange mail server can be accessed via Outlook, which provides a single location for organizing and managing day-to-day information, from email and calendars to contacts and task lists. Exchange email accounts can be accessed by logging into Office 365 with your CougarNet credentials or through Access UH. They can also be configured on [IOS](#) and [Android](#) mobile devices. Additional assistance can be found at the [Get Help](#) page.

Webcams: Access to a webcam is required for most online courses at UH, but it **will not required for this particular course unless unforeseen circumstances require the University to administer exams remotely.**

Honor Code Statement: Students may be asked to sign an honor code statement as part of their submission of any graded work including but not limited to projects, quizzes, and exams: "I understand and agree to abide by the provisions in the [University of Houston Undergraduate Academic Honesty Policy](#), [University of Houston Graduate Academic Honesty Policy](#). I understand that academic honesty is taken very seriously, and in the cases of violations, penalties may include suspension or expulsion from the University of Houston."

Helpful Information:

COVID-19 Updates: <https://uh.edu/covid-19/>

Coogs Care: <https://www.uh.edu/dsaes/coogscare/>

Laptop Checkout Requests: <https://www.uh.edu/infotech/about/planning/off-campus/index.php#do-you-need-a-laptop>

Health FAQs: <https://uh.edu/covid-19/faq/health-wellness-prevention-faqs/>

Student Health Center: <https://uh.edu/class/english/lcc/current-students/student-health-center/index.php>

Whenever possible, and in accordance with 504/ADA guidelines, we will attempt to provide reasonable academic accommodations to students who request and require them. Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (<http://www.uh.edu/caps>) by calling 713-743-5454 during and after business hours for routine appointments, if you or someone you know is in crisis. No appointment is necessary for the "Let's Talk" program (http://www.uh.edu/caps/outreach/lets_talk.html), a drop-in consultation service at convenient locations, and hours around campus.