

Math 5341
Mathematical Modeling
Summer 2020

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

Office Hours: By appointment.

Course Homepage: This course will use the Space LMS. **After 5/25/2020**, go to <https://www.space.uh.edu>, create an account, and access the course.

Textbook: Notes will be provided

Prerequisites: Calculus III, and linear algebra.

Course Overview: Basics of random sampling and an introduction to Monte Carlo methods, a review of multivariable calculus and linear algebra, orthogonality, projection and visualization in higher dimensions, least squares approximation and multiple linear regression, discrete and continuous dynamical systems, stability theory associated with steady states and periodic solutions for continuous and discrete dynamical systems, periodic solutions for discrete dynamical systems, and multiple applications. Computations will be part of regular assignments, and I'll provide guidance and sample code using Excel, Matlab and Python. 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. Students will not be tested over Excel/VBA, Matlab, Python, etc. but it will be necessary to use these types of tools to complete many of the computations in the assignments.

Live Online Meetings: The class will have **optional** live online meetings on Thursday 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. Questions are as important as answers, and even incorrect answers can receive points. **No Discussion Board grades will be dropped.**

Additional Communication: Students will receive emails from the instructor a few times each week, 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 the instructor, 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 several times 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 several times during the semester. Students will submit their written homework by scanning and uploading their work. Instructions will be given. **One Written Assignment will be dropped** (the one with the lowest grade).

Exams: A midterm and final exam will be given, with at least one of these taking place on the UH campus. Specific information will be given during the first week of class. **We will work with students**

who are not in the Houston area to accommodate testing in their areas. See the section below on Proctored Exams. The dates and times of the exams will be announced during the first week of classes.

Grades:

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.

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.

Proctored Exams:

Students in this course will take a midterm exam and a final exam. At least one of these will be proctored. If an exam is not proctored, then it will be project based. 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.