COURSE SYLLABUS

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YEAR COURSE OFFERED: 2021

SEMESTER COURSE OFFERED: Spring

DEPARTMENT: Mathematics

COURSE NUMBER: 2331

NAME OF COURSE: Linear Algebra

FORMAT AND TIME: Online Synchronous, MoWe 2:30-4:00 pm

    (all online through MS Teams)

INSTRUCTOR: Giselle Sosa Jones (ggsosajo@central.uh.edu, https://www.math.uh.edu/~ggsosajo/)

OFFICE HOURS: We 10:00 – 11:00 am
(all online through MS Teams)

TUTORING HOURS: Mo 1:00 - 2:00 pm
(all online through MS Teams)
Tutor name: Cristian Meraz

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The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

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Prerequisites

Credit for or concurrent enrollment in MATH 1432.
Contact NSM Academic Advising with all enrollment requests.

Communication With Instructor

If you wish to contact the instructor, you must do so only with your UH email address and using the email provided above (ggsosajo@central.uh.edu), not the MS Teams chat.

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Major Assignments/Exams

- Final exam: 30% **(Monday, May 10 2-5pm)**

  The final exam is comprehensive.

- Tests 1 and 2: 25% each

  Tests are to be taken at home during class time. The dates and times for tests are fixed and cannot be changed without a prior permission from the instructor. Supporting documentation must be presented if a student requests a test change date due to an emergency.

- Homeworks: 20%

  There will be weekly homework assignments (there might be more than one assignment per week). The homework problems and due dates will be posted on Blackboard. Homeworks should be submitted through Blackboard as one single PDF. No email submissions will be accepted.

Required Textbook

Linear Algebra and Its Applications (5th Edition), David C. Lay

Grade Distribution

A	> 93	B-	[80,83)	D+	[63,67)
A-	[90,93)	C+	[77,80)	D	[60,63)
B+	[87,90)	C	[73,77)	D-	[50,60)
B	[83,87)	C-	[67,73)	F	< 50

List of discussion/lecture topics

1. **Linear Equations in Linear Algebra**
   1.1 Systems of Linear Equations
   1.2 Row Reduction and Solution Sets of Linear Systems
   1.3 Vector Equations
   1.4 The Matrix Equation $Ax = b$
   1.5 Solutions Sets of Linear Systems

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1.7 Linear Independence
1.8 Introduction to Linear Transformations
1.9 The Matrix of a Linear Transformation

2. **Matrix Algebra**
   2.1 Matrix Operations
   2.2 -2.3 The Inverse of a Matrix and Characterizations of Invertibility
   2.4 Partitioned Matrices
   2.8 Subspaces of R^n
   2.9 Dimensions and Rank

3. **Determinants**
   3.2 Properties of Determinants, the Determinant and Invertibility
   3.3 Cramer's Rule, Volume and Linear Transformations

4. **Vector Spaces**
   4.1 Vector Spaces and Subspaces
   4.2 Null Spaces, Column Spaces and Linear Transformations
   4.3 Linearly Independent Sets; Bases
   4.4* Coordinate Systems
   4.5 The Dimension of Vector Space
   4.6 Rank
   4.7* Change of Basis
   4.9* Application to Markov Chains

5. **Eigenvalues and Eigenvectors**
   5.1 Eigenvectors and Eigenvalues
   5.2 The Characteristic Equation
   5.3 Diagonalization
   5.4* Eigenvectors and Linear Transformations
   5.5* Complex Eigenvalues
   5.6-5.8* Applications

6. **Orthogonality and Symmetric Matrices**
   6.1 Inner Product, Length, and Orthogonality
   6.3 Orthogonality and Projections
   6.4 The Gram-Schmidt Process
   6.5* Least-Squares Problems

7. **Symmetric Matrices and Quadratic Forms**
   7.1* Diagonalization of Symmetric Matrices
   7.2* Quadratic Forms
   7.3* The Singular Value Decomposition

* Sections are optional, as time permits

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Office Hours

There will be one online office hour on MS Teams per week on Wednesdays 10:00 – 11:00 am.

Tutoring Hours

There will be one online tutoring hour on MS Teams per week on Mondays 1:00 pm – 2:00 pm. This tutoring will be held by Cristian Meraz.

Synchronous Online Courses

This course is being offered in the Synchronous Online format. Synchronous online class meetings will take place according to the class schedule. There is no face-to-face component to this course. In between synchronous class meetings, there may also be asynchronous activities to complete (e.g., discussion forums and assignments).

Live meetings for this course will take place according to the class schedule. Video recordings of live meetings will be posted afterwards; if you miss a live meeting, watch the video as soon as possible to keep up with the teaching schedule. Live meetings will take place on **MS TEAMS**. All students at UH have access to Office 365 which includes use of Microsoft Teams. For help and instructions accessing Microsoft Teams please consult this video guide. Students enrolled in this class will be automatically added to their instructor's Team. Make sure you are a member of the Team: MATH2331-27579-2021-SP.

- Students are expected to behave professionally during live meetings. Any student who does not follow the university's code of conduct might be removed from the meeting.
- **Turn off your webcam and microphone before joining the meeting.**
- By joining a live meeting, students give consent to be recorded on the live meeting video.

This course will have a final exam per the University schedule. The exam will be delivered in the synchronous online format on **Monday, May 10, 2-5pm**.

Required Equipment

Computer, web camera, and internet access is required for this course. For the current list of minimum technology requirements and resources, copy/paste/navigate to the URL http://www.uh.edu/online/tech/requirements. For additional information, contact the office of Online & Special Programs at UHOnline@uh.edu or 713-743-3327. In summary, students will need:

- PC/Laptop or any other device with web browsing capability AND a web-camera, external or built-in, for recording a student during tests. For tests we will be using

Blackboard tools: LockDown Browser and RespondusMonitor. Students must familiarize themselves with these tools prior to tests (see http://www.uh.edu/blackboard/downloads/Learn_LockdownBrowser_student_guide.pdf).

- Ability to log in to CASA for online tests
- A PDF viewer and ability to watch mp4files
- Ability to access Microsoft TEAMS. Note that all UH students have access to MS Team with their cougarnet ID.
- A scanning app on a phone or other device for scanning homeworks into a PDF with multiple pages. Alternatively, students can use a writing pad to write directly on a PDF.

<u>General Information</u>

<u>Excused Absence Policy</u>

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. Additional policies address absences related to military service, religious holy days, pregnancy and related conditions, and disability.

<u>Recording of Class</u>

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.

<u>Syllabus Changes</u>

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 Blackboard.

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Resources for Online Learning

The University of Houston is committed to student success, and provides information to optimize the online learning experience through our Power-On website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, and Blackboard; 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 Acccess 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 students participating remotely in this course. Webcams must be turned on during exams to ensure the academic integrity of exam administration.

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 . 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://www.uh.edu/healthcenter/

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad or hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine

appointments or if you or someone you know is in crisis. No appointment is necessary for the "Lets talk" program, a drop in consultation service at convenient locations and hours around campus. https://uh.edu/caps/outreach/lets%20talk.html.

Students with disabilities need to register with the Center for Students with Disabilities and present any accommodation requests by the first week of class. Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance. Do not hesitate to meet with me to discuss such concerns/needs.

Proctored Exams The University of Houston's Online & Special Programs (OSP) office facilitates all off-campus proctoring services for online students at the University. 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.