

Syllabus

Course Information

Course Information

Course Number: Math 304

Course Title: Linear Algebra

Section: 511

Time: TR 9:35-10:50 am

Location: BLOC 128

Credit Hours: 3

Instructor Details

Instructor: John (Nick) Treuer

Office: Bloc 601N

Phone: N/A

E-Mail: jtreuer@tamu.edu (<mailto:jtreuer@tamu.edu>) (Include "Math 304" in subject line if you email me)

Office Hours: Tuesday 12-1 and Thursday 12-2 pm on Zoom

Zoom Link for Office Hours: [Click here](https://tamu.zoom.us/j/97167926934?pwd=L3lVREFYjJjbEp3WFNIYjZNbk0ydz09) (<https://tamu.zoom.us/j/97167926934?pwd=L3lVREFYjJjbEp3WFNIYjZNbk0ydz09>)

- Your zoom account must be linked to a *.tamu.edu or *.ag.tamu.edu account in order to join

Course Description

This introductory course in linear algebra is for engineering majors, computer science majors, and mathematics education majors. It will cover linear systems of equations, matrices, determinants, vector spaces, linear transformations, orthogonality and eigenvalues. MATH 323 designed to be a more demanding version of this course. Only one of the following will satisfy the requirements for a degree: MATH 304, MATH 309, MATH 311 and MATH 323.

Course Prerequisites

MATH 148, MATH 152, or MATH 172; junior or senior classification.

Course Learning Outcomes

Students will master basic notions and techniques in linear algebra. Emphasis will be on applications and problem solving. Students will be able to produce simple proofs, and use mathematical language and formalism.

Textbook and/or Resource Materials

Linear Algebra with Applications, Tenth Edition. By Steven J. Leon / Lisette de Pillis

To purchase materials for this class you can visit the TAMU bookstore (online or in person).

Grading Policy

1. The components of the overall course score are as follows:

- Homework: 20%
- Midterm 1: 22.5%
- Midterm 2: 22.5%
- Final: 35%

The final grade is determined as follows:

A: ≥ 90 , B: $[80,90)$, C: $[70,80)$, D: $[60,70)$, F: < 60 .

Homework: There will be weekly homework, which will be turned in through the Canvas page. The lowest homework grade will be dropped at the end of the course. You must do all of the problems on the homework; only a subset of the questions on each homework will be graded however. Late homework will not be accepted.

Late Work Policy

*Work submitted by a student as makeup work for an excused absence is not considered late work and is exempted from the late work policy (**Student Rule 7** (<https://student-rules.tamu.edu/rule07/>)).*

Make-ups for exams and homework will be given only in case of an absence authorized under University Regulations. University student rules concerning excused and unexcused absences as

well as makeups can be found by reading **Student Rule 7** [_ \(https://student-rules.tamu.edu/rule07/\)](https://student-rules.tamu.edu/rule07/).

Course Schedule

Midterm 1: Thursday, September 29 (Week 6, roughly Chapters 1-2)

Midterm 2: Tuesday, November 8 (Week 12, roughly Chapters 3-4)

Final Exam: Friday, December 9 12:30-2:30 pm

Dates for midterms 1 and 2 may be changed, but written notification to all students in the course will be given via email if that happens

Course schedule: (Tentative; sections are from the textbook, does not include Midterms)

Lecture 1: 1.1 Systems of linear equations

Lecture 2: 1.2 Row echelon form

Lecture 3: 1.3 Matrix arithmetic

Lecture 4: 1.4 Matrix algebra

Lecture 5: 1.5 Elementary matrices

Lecture 6: 2.1 The determinant of a matrix

Lecture 7: 2.2 Properties of determinants

Lecture 8: 2.3 Additional topics and applications

Lecture 9: 3.1 Definitions and examples

Lecture 10: 3.2 Subspaces

Lecture 11: 3.3 Linear independence.

Lecture 12: 3.4 Basis and dimension.

Lecture 13: 3.5 Change of basis.

Lecture 14: 3.6 Row space and Column space

Lecture 15: 4.1 Definitions and examples

Lecture 16: 4.2 Matrix representations of linear transformation

Lecture 17: 4.3 Similarity

Lecture 18: 5.1 The scalar product in \mathbb{R}^n

Lecture 19: 5.2 Orthogonal subspaces

Lecture 20: 5.3 Least square problems

Lecture 21: 5.4 Inner product spaces

Lecture 22: 5.5 Orthonormal sets

Lecture 23: 5.6 The Gram-Schmidt orthogonalization process

Lecture 24: 6.1 Eigenvalues and eigenvectors

Lecture 25: 6.3 Diagonalization

Lecture 26: Final review

Copyright policy:

All printed materials disseminated in class or on the web are protected by US Copyright Laws. One xerox copy (or download from the web) is allowed for personal use. Multiple copies or sale of any of these materials is strictly prohibited.

University Policies

This section outlines the university level policies. The TAMU Faculty Senate established the wording of these policies.

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to **Student Rule 7** (<https://student-rules.tamu.edu/rule07/>) in its entirety for

information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to **Student Rule 7** (<https://student-rules.tamu.edu/rule07/>) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" (**Student Rule 7, Section 7.4.1** (<https://student-rules.tamu.edu/rule07/>)).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" (**Student Rule 7, Section 7.4.2** (<https://student-rules.tamu.edu/rule07/>)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (**See Student Rule 24** (<https://student-rules.tamu.edu/rule24/>)).

Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" (**Section 20.1.2.3, Student Rule 20** (<https://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules>)).

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You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu (<https://aggiehonor.tamu.edu>).

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources office on your campus (resources listed below). Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

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Disability Resources is located in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu [\(https://disability.tamu.edu/\)](https://disability.tamu.edu/).

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](https://rules-saps.tamu.edu/PDFs/08.01.01.M1.pdf) [_ \(https://rules-saps.tamu.edu/PDFs/08.01.01.M1.pdf\)](https://rules-saps.tamu.edu/PDFs/08.01.01.M1.pdf)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the

resources you need.

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*Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with **Counseling and Psychological Services** (<https://caps.tamu.edu/>) (CAPS).*

*Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's **Title IX webpage** (<https://titleix.tamu.edu/>).*

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing available resources and services on your campus.

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*Students who need someone to talk to can contact **Counseling & Psychological Services** (<https://caps.tamu.edu/>) (CAPS) or call the **TAMU Helpline** (<https://caps.tamu.edu/helpline/>) (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at **suicidepreventionlifeline.org** (<https://suicidepreventionlifeline.org/>).*

Campus Specific Policies

Statement on the Family Educational Rights and Privacy Act (FERPA)

FERPA is a federal law designed to protect the privacy of educational records by limiting access to these records, to establish the right of students to inspect and review their educational records and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings. Currently enrolled students wishing to withhold any or all directory information items may do so by going to **howdy.tamu.edu** (<https://howdy.tamu.edu/>) and clicking on the "Directory Hold Information" link in the Student Records channel on the MyRecord tab. The complete **FERPA Notice to Students** (<http://registrar.tamu.edu/Catalogs%2C-Policies-Procedures/FERPA/FERPA-Notice-to-Students#0-StatementofRights>) and the student records policy

is available on the Office of the Registrar webpage.

Items that can never be identified as public information are a student's social security number, citizenship, gender, grades, GPR or class schedule. All efforts will be made in this class to protect your privacy and to ensure confidential treatment of information associated with or generated by your participation in the class.

Directory items include name, UIN, local address, permanent address, email address, local telephone number, permanent telephone number, dates of attendance, program of study (college, major, campus), classification, previous institutions attended, degrees honors and awards received, participation in officially recognized activities and sports, medical residence location and medical residence specialization.

College and Department Policies

Electronic Devices policy:

- Electronic devices can only be used for educational purposes that relate to activities done in class.
 - See your instructor if you have other circumstances where a device is needed daily for non-class related items (i.e., medical, first responder, etc.).
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