

MATH 4305 Syllabus

Topics in Linear Algebra, Section [X], 3 credits
Summer 2026

Instructor Information

Instructor

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General Course Information

Description

Course Number and Title: MATH 4305, Topics in Linear Algebra

Prerequisites: MATH 1502 or MATH 1512 or MATH 1555 or MATH 1504, and (MATH 1552 or MATH 15X2 or MATH 1X52) and (MATH 1522 or MATH 1553 or MATH 1554 or MATH 1564 or MATH 1X53)

A fast-paced course on basic concepts of linear algebra and their applications. Topics include: linear equations, linear transformations, subspaces of \mathbb{R}^n and their dimensions, vector spaces, orthogonality and least squares, determinants, eigenvalues and eigenvectors, symmetric matrices, and quadratic forms.

Course Learning Outcomes

- Students will solve systems of linear equations and interpret solutions geometrically.
- Students will understand and apply linear transformations and their matrix representations.
- Students will analyze subspaces, bases, and dimensions of vector spaces.
- Students will use orthogonality and least squares methods to solve applied problems.
- Students will compute determinants and apply them to characterize invertibility and geometric properties.
- Students will find eigenvalues and eigenvectors and apply them to diagonalization.
- Students will analyze symmetric matrices, quadratic forms, and related decompositions.

Required Course Materials

Textbook: Bretscher, Linear Algebra with Applications, 5th ed., Pearson

We will use Gradescope to manage assignments and assessments. Assignments will be posted on Canvas and submitted electronically through Gradescope. You are encouraged to download the Gradescope app and familiarize yourself with uploading handwritten work.

Grading Policy

Your final grade is a weighted sum of your grades on homework, midterm exams, and the final exam:

Homework (average):	15%
Midterm Exams :	Highest 30% + Lowest 20% + 25%
Group Project:	10%

Letter grades: A: 90–100, B: 80–89, C: 70–79, D: 60–69, F: 0–59.

An Incomplete ('I') is assigned only when a student was making satisfactory progress but was unable to complete the course for non-academic reasons beyond their control and deemed acceptable by the instructor.

Description of Graded Components

HOMEWORK: Weekly homework assignments will be posted on Canvas and submitted electronically via Gradescope. For each assignment, a subset of problems will be graded. The deadline is 11:59 PM on the due date. Late homework will not be accepted for any reason. Collaboration is encouraged; list all collaborators on your submission.

MIDTERM EXAMS: There will be three in-person midterm exams. No makeup exams will be given. Exceptions may be made for Georgia Tech-sponsored events or documented illness; contact the instructor at least 48 hours before the exam. Travel is not an acceptable reason to miss an exam.

GROUP PROJECT: The final project will be presented in groups in the last two lectures. Your group project will be graded on the presentation and the report submitted.

Please note: items on the syllabus are subject to change. Any changes will be communicated in class and on Canvas.

Course Policies

Attendance and Participation

Students who miss class are responsible for all material, assignments, and announcements made during missed lectures.

Examinations will be administered in-person and on-campus only. Makeup exams will only be provided for excused absences. To qualify, contact the Office of the Vice President and Dean of Students with dated documentation from a medical professional. Travel is not an acceptable reason to miss an exam.

Regrades

Regrade requests must be submitted on Gradescope within one week after graded work is returned. Requests will only be considered when something correct has been marked incorrect.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code at www.honor.gatech.edu.

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate and identify the appropriate penalty for violations.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your needs and obtain an accommodations letter. Please also email me as soon as possible to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. I encourage you to remain committed to the ideals of Georgia Tech while in this class.