Math 200 - Linear Algebra

Spring 2026

Emily Proctor

212 Warner Hall

Office Hours: M 3:00-4:00pm, Tu 12:30-2:00pm, Th 3:15-4:15pm, and by appointment.

eproctor@middlebury.edu

Course Description

Linear algebra is an accessible yet powerful branch of mathematics that supports the work of many other disciplines, including pure and applied mathematics, statistics, computer science, economics, political science, and more. One of our main objectives in this class will be to use linear algebra as a vehicle for moving from the concrete to the abstract. We will proceed in a step-by-step way from the very hands-on problem of finding the solutions of a system of two equations in two unknowns to a full development of the theory of vector spaces and linear transformations. As we work our way through the course, our other main goal will be to work on developing proof-writing skills and style.

Course Website

The website for this course can be found at:

https://s26.middlebury.edu/MATH0200B

Here you will find course information and homework assignments.

Text

We will cover most of Chapters 1 through 6 in *Linear Algebra and Its Applications, 6th ed.* by Lay, Lay, and McDonald.

Course Objectives

The goals of this course are to help you develop:

- familiarity with and an understanding of the concepts, notation, and theory of linear algebra,
- the ability to apply your understanding to solve straightforward and complex problems,
- skills in collaboration and communication,
- introductory proof-reading and proof-writing skills, and
- the confidence that comes with taking ownership of your learning process.

Course Structure and Homework

Homework assignments will be posted on the course website after each class and are due at the beginning of the following class period.

Doing your homework diligently is the best way to succeed in this course. Math is most easily absorbed in small, consistent chunks. By looking at the material for a little while each day and keeping up with the problem sets, over time you will build intuition for the subject. If you keep a steady rhythm with the homework, you will learn the material well.

Please **write neatly** and **staple your work**. The best way to prepare for exams is to take your homework seriously.

I am here to help! If you would like help with an assignment or with some of the material that we cover in class, I would love to see you during my office hours. The Q-center in BiHall also hosts student-run help sessions for linear algebra classes on Sunday, Tuesday, and Thursday evenings.

Homework problems are graded on a 0-1-2 scale. A 2 is given for a mostly or totally correct answer accompanied by a complete explanation, a 1 is given if the exercise is attempted but isn't quite right or lacks a complete explanation, and a 0 is given for little or no work shown (even if the answer is correct).

Please note that late homework will not be accepted. Late homework will receive an overall score of zero. You may however, hand in homework early if a conflict arises. In order to create space for unexpected events that might arise during the semester, when computing your final grade for the course, I will drop your three lowest homework scores.

Exams

There will be two midterms and a final exam for this class. The exams are scheduled for

Tuesday, March 10, 7-9pm

Tuesday, April 14, 7-9pm

Friday, May 15, 9am-12pm.

If you have a conflict with either midterm exam date, please see me **two weeks** before the scheduled exam date to arrange to take the exam early. If you become sick shortly before the exam, please go to the health center to obtain documentation.

Note that **vacation plans are not a legitimate reason for arranging an early final exam** so please plan to be on campus until after our exam.

Attendance and Etiquette

I expect you to attend all classes. Unless you check with me ahead of time, please arrive on time and stay in the classroom for the full period. This is an active learning class, so your success in this class will depend on your engagement. Your presence in class also makes a significant contribution to class as a whole.

Your class participation grade will be based on your attentive and active contribution to our class. You can miss up to three classes, for whatever reason (including illness), without penalty. Further absences will have a negative impact on your class participation grade. If you become so sick that you need to miss more than one class in a row, please stay in touch and we will make a plan to accommodate this.

Honor Code

Since collaboration is a major mathematical skill, I strongly encourage you to work together with your classmates to figure out the homework problems. At the same time, it is important that you receive feedback on your work that is appropriate to your own particular situation. Thus, your final write-up of each homework problem must be your own. The best way to achieve this is to **talk** with classmates while you figure out how to do a problem, then **write** your answer on your own.

Our homework and exams are designed to provide you the direct practice needed to develop your mathematical skills and proficiency. Since the use of AI tools goes counter to this, you are strongly

discouraged from using them for your homework. I expect you to complete exams entirely on your own. All exams will be closed-book and the use of any resources beyond those specifically outlined will be considered a breach of the Honor Code.

Students with Disabilities

Students who have Letters of Accommodation in this class are encouraged to contact me as early in the semester as possible to ensure that such accommodations are implemented in a timely fashion. For those without Letters of Accommodation, assistance is available to eligible students through the Disability Resource Center (DRC). Please contact ADA Coordinators in the DRC at ada@middlebury.edu for more information. All discussions will remain confidential.

Grading

I will determine final grades according to the following percentages:

Exam 1	30%
Exam 2	30%
Final Exam	25%
Homework and Class Participation	15%

Tentative Schedule of Topics

Week Beginning	Topics
Feb 9	Solving systems of linear equations, row reduction, vector equations
Feb 16	Matrix equation $A\mathbf{x} = \mathbf{b}$, solution sets of linear systems, linear independence
Feb 23	Linear transformations and matrices, matrix operations
Mar 2	Inverting matrices, characterizations of invertible matrices
Mar 9	Introduction to and properties of determinants, (Exam 1), determinants and volume
Mar 16	Vector spaces and subspaces, null and column spaces
Mar 23	Spring Break!
Mar 30	Linear independence, bases, coordinate systems
Apr 6	Dimension of a vector space, rank, change of basis
Apr 13	Eigenvalues, eigenvectors, (Exam 2), (Spring Symposium)
Apr 20	The characteristic equation, diagonalization, eigenvectors and linear transformations
Apr 27	E-vectors and LTs cont., inner products, length, orthogonality, orthogonal sets
May 4	Orthogonal projections, The Gram-Schmidt process, least-squares
May 11	Wrap-up