Math 22 - Linear Algebra
Fall 2024

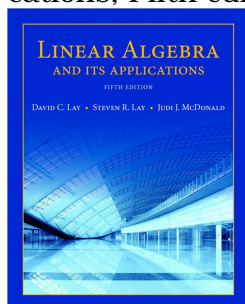|	
Section:	1
Instructor:	Ahmad Reza Haj Saeedi Sadegh
Lectures:	MWF 12:50 PM-1:55 PM
Classroom:	Kemeny 108
X-Hours:	Tu 1:20 PM-2:20 PM
Office:	Kemeny 310
E-mail:	ahmadreza.hajsaeedisadegh@dartmouth.edu
Tutorial:	TuThSu 7 PM-9 PM

Course Description

Linear algebra is the study of linear equations, which, in some sense, are the simplest type of equations we know how to solve. Applications of this subject are pretty vast; from abstract algebra, functional analysis, and PDE in mathematics to physics, engineering, machine learning, AI, genetics, economics, and even social sciences, you will always find traces of linear algebra.

In this class, we will work mostly with the vector space Rn. We will learn how to represent linear transformations with matrices and study different types of linear transformations, such as diagonalizable transformations. During the last weeks of classes, we will concentrate on applications.

Textbooks and Course Materials

📘 **textbook:** We will be using the following textbooks:

- Steven R Lay, David C Lay, and Judi McDonald Linear Algebra and its applications, Fifth edition (ISBN: 978-0321982384).

Exams

	Date and Time	Location
Midterm 1	October 10 - 7:00 PM	Wilder 104
Midterm 2	October 31 - 7:00 PM	Wilder 104
Final Exam	November 22 - 3:00 PM	TBA

Grading cut-off

	% of total grade
WebWork	15
Homework	15
Participation	5
Midterms	40 = 20 + 20
Final Exam	25

WeBWorK

The daily web-based problems can only be accessed by clicking the corresponding link in the Assignments section of Canvas. See also the WeBWorK homepage (https://webwork.dartmouth.edu/) containing a FAQ and quick start guide.

It is highly recommended that you keep a notebook in which you write up your WeBWorK homework (including your work as well as the answers). Then when you are studying for exams, you will have a record of your work to which to refer.

WeBWorK assigned from each class should be done by the next class. This preparation will be expected during the lecture. That being said, the formal deadline is set to be the morning of the class after the next one. For instance, WeBWork assigned on Fridays must be completed by 9 a.m. the following Wednesday morning. Similarly, WeBWork assigned on Mondays is due by 9 a.m. on the upcoming Friday morning within the same week. So, although you have the authority to grant yourself a short extension if necessary, at no penalty, you should not do so consistently if you want to keep pace with the course.

Homework

Written homework assignments will be assigned once a week and will be posted on Canvas. They will be collected every Wednesday via Gradescope.

No late homework will be accepted. Please do not ask for extensions on the homework. Homework is to be written neatly. Make sure not to write too close to the margins; otherwise, when you scan it, there might be missing information. Make sure that before you submit your homework, you check to make sure that all information has been scanned and that it can be read.

Use complete sentences when writing explanations or justifications. If you can't read your solutions aloud as fluently as if you were reading a textbook, try using nouns and verbs in your write-ups! If you do not follow these guidelines, your written homework will be returned to you ungraded.

The lowest homework score will be dropped.

PARTICIPATION

Each week you will be asked to submit a post on the Discussions page in Canvas. It will be initiated by a prompt. The idea is to have a weekly conversation generally inspired by something mathematical and usually related to our class. The point is th, and in particular, a lot of linear algebra is going on in particular, a lot of linear algebra going on the quantified digital work that we inhabit. This is sometimes exciting, sometimes unnerving, and most times, worth thinking about and talking about. Your posts can be in response to earlier posts, start new subjects, but whatever they are, they need to be thoughtful (posts that essentially just say "I agree" are not acceptable) and civil. They are graded as 0 (didn't do it) or 1 (did it) and the total comprises your participation grade.

The lowest two discussion scores will be dropped.

TUTORIALS

Our graduate teaching assistants Rohan Kapoor and Benjamin Shapiro will run tutorials on Tuesday, Thursday, and Sunday from 7:00-9:00pm in 105 Kemeny, focusing on answering your questions as you work through understanding the concepts. You can get help with questions regarding the course topics and homework assignments. Tutorials are open to all Math 22 students. You don't need an appointment.

ACADEMIC HONOR CODE

Students are encouraged to work together on homework problems. What is important is a student's eventual understanding of homework problems, not how that is achieved.

The honor principle on homework: What a student turns in as a homework solution is his or her understanding of how to do the problem. Students must state what sources they have consulted, with whom they have collaborated, and from whom they have received help. If you have not talked with anyone or consulted any source, please write "No Collaborators." It violates the honor code to copy solutions from problems posted on the web, books, or any other source. The solutions you submit must be written by you alone.

The honor principle on exams: Students may not give or receive assistance of any kind on an exam from anyone except the professor or someone explicitly designated by the professor to answer questions about the exam.

If you have any questions about whether some action would be acceptable under the Academic Honor Code, please speak to me. I will be glad to help clarify things. It is always easier to ask beforehand than to have trouble later!

CONSENT TO RECORD

1. Consent to recordings of course and group office hours: By enrolling in this course, a) I affirm my understanding that the instructor may record this course and any associated group meetings involving students and the instructor, including but not limited to scheduled and ad hoc office hours and other consultations, within any digital platform used to offer remote instruction for this course; b) I further affirm that the instructor owns the copyright to their instructional materials, of which these recordings constitute a part, and my distribution of any of these recordings in whole or in part without the prior written consent of the instructor may be subject to discipline by Dartmouth up to and including expulsion;

---

2. Requirement of consent to one-on-one recordings: By enrolling in this course, I hereby affirm that I will not under any circumstance make a recording in any medium of any one-on-one meeting with the instructor without obtaining the prior written consent of all those participating, and I understand that if I violate this prohibition, I will be subject to discipline by Dartmouth up to and including expulsion, as well as any other civil or criminal penalties under applicable law.

MENTAL HEALTH

Being a student is challenging; our terms are intensive, and in this term, in particular, your classes are probably not the only demanding part of your life. There are several resources available to you to support your wellness, including your undergraduate dean (http://www.dartmouth.edu/~upperde/), Counseling and Human Development (http://www.dartmouth.edu/~chd/), and the Student Wellness Center (http://www.dartmouth.edu/~healthed/).

STUDENT ACCESSIBILITY NEEDS

Students requesting disability-related accommodations and services for this course are encouraged to schedule an appointment with their instructor as early in the term as possible. For accommodations to be authorized, students are required to consult with Student Accessibility Services (SAS Email:student.accessibility.services@dartmouth.edu; SAS Phone: 603-646-9900) and to email their instructor their SAS accommodation form. If students have questions about whether they are eligible for accommodations, they should contact the SAS office. All inquiries and discussions will remain confidential.

RELIGIOUS OBSERVANCES

Some students may wish to participate in religious observances during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with your instructor before the end of the second week of the term to discuss appropriate accommodations.

TITLE IX

At Dartmouth, we value integrity, responsibility, and respect for the rights and interests of others, all central to our Principles of Community. We are dedicated to establishing and maintaining a safe and inclusive campus where all have equal access to the educational and employment opportunities Dartmouth offers. We strive to promote an environment of sexual respect, safety, and well-being. In its policies and standards, Dartmouth demonstrates unequivocally that sexual assault, gender-based harassment, domestic violence, dating violence, and stalking are not tolerated in our community.

The Sexual Respect Website (https://sexual-respect.dartmouth.edu/) at Dartmouth provides a wealth of information on your rights with regard to sexual respect and resources that are available to all in our community.

Please note that I am obligated to share disclosures regarding conduct under Title IX with Dartmouth's Title IX Coordinator. Confidential resources are also available and include licensed medical or counseling professionals (e.g., a licensed psychologist), staff members of organizations recognized as rape crisis centers under state law (such as WISE), and ordained clergy (see https://sexual-respect.dartmouth.edu/reporting-support/quick-reference-guides/undergraduate-resource-sheet).

Should you have any questions, please feel free to contact Dartmouth's Title IX Coordinator or the Deputy Title IX Coordinator for the Guarini School. Their contact

information can be found on the sexual respect website at https://sexual-respect.dartmouth.edu.