

Overview

Instructor:

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Course description:

Linear algebra is, roughly speaking, the study of "flat" geometric objects (lines, planes, etc.; no curves) and their abstract properties, captured by the basic operations of addition and scaling which appear all over mathematics in contexts that may not seem "geometric" at all: differential equations, number theory, combinatorics, etc. Thus, linear algebra serves as an essential foundation for just about every other area of math.

Topics we will cover include: concrete and abstract vector spaces; linear transformations and matrices; systems of linear equations and Gaussian elimination; determinants; eigenvalues, eigenvectors, and diagonalization; and inner products, adjoints, and the spectral theorem.

Technology requirements:

This course takes place entirely online.

You will need a computer or phone with good internet, microphone, and preferably webcam to participate in course activities.

You will need either a way to scan and/or take pictures of homeworks and exams, or the ability to write math quickly on a computer (within the time allotted for an exam).

All times listed below are in US Central Time. Note that there will be a switch from CST to CDT on March 14.

Lectures and readings:

Lectures are on [Zoom](#) at **12-12:50pm MWF**. (Note that to avoid Zoombombing, you will be required to sign in.)

The **textbook** for the course is [Linear Algebra Done Wrong](#) by Sergei Treil. We will be following it fairly closely (although not always in the same order).

I will be posting readings each week (under "Schedule") corresponding to the material covered in lectures. I strongly recommend doing at least some of the readings on a regular basis. While all of the main concepts will be covered in lectures, the readings will contain more details, additional examples, etc.

I will not be taking attendance in lectures, but **it is very important to avoid falling behind**. The homeworks and exams will test conceptual understanding that takes time to develop; you can't simply "look up" everything you need to know at the last minute.

Discussions and communications:

Regular course announcements will be posted on Moodle under "Announcements". Special announcements will also be sent out via email.

There will be three interactive modes of communication available: the discussion forum, Zoom office hours, and email.

The **discussion forum** will be on [Campuswire](#). The forum is preferred for most questions.

Office hours will take place on [Zoom](#) each week at **TBD**. These are best for specific questions that require a back-and-forth. It would be ideal if you have a method of sharing math in real time (e.g., a tablet, or webcam + paper).

You can also **email** me any questions; but note that this is the least interactive method of communication.

You can normally expect a reply to offline questions within 24 hours. (Do not expect a reply to last-minute questions)

shortly before a homework or exam is due.)

Homeworks and quizzes:

There will be two types of weekly assessments: homeworks and quizzes, posted under "Schedule".

Quizzes will be worth **10%** of your final grade, with no grades dropped, **due on Tuesdays at 4pm**. These will be open-book and randomized, with some form of instant automatic grading with unlimited tries (the precise format is TBD). The goal is to give you lots of low-stakes practice with the basic techniques; looking up answers is a bad idea!

Homeworks will be worth **15%** of your final grade, with the lowest grade dropped, **due on Thursdays at 4pm**; in addition, you may hand in 2 homeworks up to 24 hours late with no penalty. These will be written questions where you will need to give some form of work or explanation, and will be graded largely on that basis; a correct answer by itself will get you little to no points. You will need to type, scan, or take a photo of your homework and then upload it to Moodle.

If you hand in a homework late, of course you may not look at the solution if it's posted before you submit it.

Collaboration is encouraged on both quizzes and homeworks, but **you must write up homework solutions yourself**.

Exams:

There will be **3 midterm exams**, worth **15%** each.

- dates TBD (all Fridays)

The **final exam** will be worth 30%, and will take place on TBD.

The exams will be online, timed, and a mix of short-answer and written questions. They will be open-book, and you are free to use any resources (including computers) **as long as you don't communicate with another person** (for example, googling is okay, but texting or posting to forums is not).

The written exam questions will be multi-step and require you to explain your work, and will be designed so that looking up the answer will get you little to no points. So don't get used to using computers! In fact, all of the computational questions in this course will be designed so that the actual computation should be easy once you know what to do; I recommend never using computers at all, except possibly to check your work.

Grading:

- 10% quizzes
- 15% homeworks (lowest dropped)
- 15+15+15% midterms
- 30% final exam

There will be no numerical scaling throughout the term. The final letter grade cutoffs will be determined at the end of the term. Grades >90% are guaranteed an A-, >80% are guaranteed a B-, etc. (the actual cutoffs may be lower).

In the event of a serious, documented illness or other crisis, an extension or excusal from a homework or exam may be granted at my discretion. All such requests must be made no later than one week after the due date.

Extensions and excusals will only be granted in serious cases. For mild illnesses (including mild cases of COVID), please use the free 1-day homework extensions and dropped homework grade.

Academic integrity:

Academic integrity will be taken seriously; see [Article I, Part 4 of the student code](#).

Disability accommodations:

If you need disability accommodations, please contact [DRES](#) for a letter of accommodation, and send me a copy of the letter. This should be done near the start of the term, well before any exams.