

Quick Facts

Semester: UC Berkeley Summer Sessions 2021

Course: MATH 110 LEC 001

Instructor: Meredith Shea (please call me Meredith, no need to be formal)

Email: mshea@berkeley.edu (This is the best way to reach me!)

Zoom link (for discussions and office hours):

A message from me...

I have tried to design this class in a way where you can tailor it to the way that you learn best. You are encouraged to go at your own speed, attend what you want to attend, participate if you want to, and use whatever resources benefit you (and I hope you will find that there are plenty available!). If you are individually motivated -- great -- if not, I hope you will find the resources and class community necessary to motivate yourself.

This class is designed to start off slowly in order to help those that need adjusting to upper level math. If you feel comfortable with the material in the beginning, I highly encourage you to get ahead of the pace. This class will speed up in the later weeks!

This is my second iteration of teaching this class online. I learned a lot from teaching it last summer and want to build upon the successes to make it the best experience possible (I mean, it is a math class). I would love to know some of the best policies and experiences you've experienced in your year online! If there is anything meaningful I can incorporate into this class I would love to do so.

Class Description

In this class we will study many common linear algebra topics from a rigorous mathematical perspective. In this class we will cover topics like: vector spaces and subspaces, linear independence and span, linear transformations, dual spaces and maps, invariant subspaces, diagonalization, eigenvalues and eigenvectors, Jordan form, inner product spaces and orthogonality, and the Spectral theorem.

Many of the topics will be familiar, however we will approach them from a completely new perspective. In this class you will not be asked to do much computationally, instead the focus will be on proving statements about the above topics.

Textbook

We will be following *Linear Algebra Done Right*, by Sheldon Axler (the third edition). You can find an electronic copy of this book for free on lib.berkeley.edu.

Proof Based Class

This class is largely proof based. This might be your first instance of a proof based class and that's okay! At the beginning of this class there will be an emphasis on proper proof writing techniques. That being said, it is a sharp learning curve and you might need to put in extra work to find success.

Class Structure

There are many ways to do an online class, so it's worth spending some time talking about how this class will function! Class will largely consist of pre-recorded lectures, themed discussion sessions, and office hours. This class is nearly asynchronous if you desire.

Exams and quizzes will happen via Gradescope. They will be timed (35 minutes for quizzes and 1.5 hours for exams), however you will have a 24 hour window to take them. All assessments are open note and open book, however you may not use other people or the internet (except Gradescope, obviously).

Pre-Recorded Lectures

Lectures are entirely prerecorded and can be found here. Most videos are between 10 and 30 minutes. There is a recommended schedule of videos you should follow to stay on track, however this aspect of the class is very independent and designed for you to do what's best for you. Since (most of) these videos are actually from last year, I have created a list which details each video's content, length, and any mistakes I made.

Class Schedule

The class schedule is the single most important page for this class! It contains the recommended video list, assignment and assessments, discussion times and office hours.

Live Sessions

Live sessions will happen over Zoom. *I will record all live sessions except office hours* and upload them for later viewing as well (please allow a day for them to get up, upload speeds are pretty abysmal in my apartment). Live sessions are spread out throughout the day to accommodate different time zones (and people who work better at different times of the day). They will generally occur at the following times...

- Quiz/exam solution sessions, 10 - 11 AM on Mondays
- Example sessions, 3:30 - 4 PM on Tuesdays
- Review sessions, 10 - 11:30 AM on Wednesdays before exams
- Office hours, 5 - 6 PM Tuesdays
- Office hours, 9:30 - 11:30 AM Wednesdays (1 - 3 PM if there is review that Wednesday)
- Office hours, 10 - 11 AM Thursdays

Please note that there are a few times when the typical schedule is changed and these are denoted in **red** on the schedule. Each live session is briefly described below.

Quiz/Exam Solution Sessions

In these sessions I'll be going over the previous weeks exam or quiz.

Example Sessions

In these sessions I'll do some homework-like problems so you can see my process and ask me questions about how I approach relevant problems. There will also be limited time for questions.

Review Session

We will go over questions and review material pertaining to the exam.

Office Hours

Office hours are best served as a place where you can do work and ask me questions if one happens to come up. I have uploaded a ton of worksheets you are encouraged to work on in office hours. You are also welcome to work on homework, catch up on videos, or review past assignments. **Please come even if you feel like you don't have specific questions! This will be a great work period!**

Also feel free to email me asking for individual appointments on any day of the week. I'm also happy to extend my working hours to something that works in your schedule!

Grading and Feedback

The class will adhere to the following grading structure:

Section	Total Points	Breakdown/Description of Points
Homework	32	Four HWs worth 8 points each.
Quizzes	27	Four quizzes worth 9 points. The lowest score will be dropped.

Exams	24	Two exams worth 12 points each.
Final	15	One (take home) final exam worth 15 points. If the percentage received on your final is better than either exam (percentage) it will be scaled to replace it.
"Check-in" points	2	Two surveys worth 1 point each.

Tentative grade bins are below for the major grades (A, B, C, F). I may decide to alter these grade bins during the semester, if the grade bins change they will only become more generous.

Letter Grade	Upper Bound (exclusive)	Lower Bound (inclusive)
A	--	85
B	85	70
C	70	50
F	50	--

Quizzes

Quizzes will be available on Gradescope for the entire day (midnight to midnight) they are listed. Once opened you will have 35 minutes to complete the quiz. Each quiz will be worth 9 points and your lowest score will be dropped.

Quizzes are open note and open book. You may not use the internet and you may not have other people help you.

Exams

Exams will be available on Gradescope for the entire day and you will have 1.5 hours to complete them. Exams will be worth 12 points each.

Exams are open note and open book. You may not use the internet and you may not have other people help you.

Final Exam

The final exam will be a more traditional take home exam worth 15 points. You will have a **full two days** to complete the final.

The final is open note and open book. You may not use the internet and you may not have other people help you.

Exam Score Replacement Policy

If you score a higher percentage on the final exam than either midterm, your final score will be scaled to replace them.

For example, suppose a student has the following scores:

Exam 1 -- 8/12

Exam 2 -- 10/12

Final -- 12/15

Since $12/15 > 8/12$ (but $10/12 > 12/15$), the student's exam 1 score is replaced by a score of 9.6/12.

Homework

Homework will be due at 11:59 pm (pacific time) every other Wednesday. Each homework will be graded out of 8 points, with 4 points dedicated to completion and 4 points dedicated to correctness.

Feel free to collaborate with your classmates on homework.

"Check in" Points

You will have some check in surveys to fill out for a few extraneous points. These will be quick and you will have ample notice. My hope is that they are easy points. :)