

Calendar for Math 22a in Fall 2024

This [calendar](#) is a preliminary plan for the fall semester for Math 22a. I plan to post updated versions if things change.

Formal syllabus document

A formal syllabus document detailing course policies is available [here](#). If we encounter policies that need to be changed, an update will be posted here.

Below is a preliminary syllabus giving an overview of the course, though for specific course policies, please refer to the formal syllabus document.

Coursepack (in-class worksheets)

Each student is responsible to have a copy of the in-class worksheet(s) for each class. The recommended way to do this is to buy a paper copy of the Math 22A coursepack from FlashPrint (99 Mt. Auburn Street, Cambridge, MA 02138, Phone: 617-492-7767, E-mail: info@flashprint.com). The coursepack contains all the daily worksheets you will need for classes, and so make sure to bring your coursepack to every class. The coursepack is expected to cost \$26.53.

As an alternative option, the in-class worksheets from the coursepack will also be posted on [this Canvas page](#), which you could print on your own or bring on an electronic tablet. If you print your own copy, you might consider getting a 3-ring binder to keep your worksheets organized for reference.

Remember: Be sure to bring your coursepack to every class (or have your own printed copy and/or tablet ready to go!).

Course Goals:

Learn the foundations of linear algebra and mathematical proofs from the foundations up;

Challenge yourselves;

Make friends; and

Learn problem solving skills for mathematics and beyond.

Overriding Course Principles:

1) Be Kind

2) Work Hard

All course policies can be derived from the two principles above.

Welcome to Math 22a!

Math 22a is a great way to get an introduction to proofs and an introduction to linear algebra all in one. I will be the course head ([Philip Matchett Wood](#)), and we will have a team of teaching fellows (mostly graduate students) and course assistants (mostly undergraduates) helping out.

Course educational goals:

Math 22a will introduce students to multi-dimensional linear algebra, including an introduction on how to understand and write mathematics proofs.

Math 22a will generally cover the computational and theoretical linear algebra topics usually covered in Math 21b, including some applications of linear algebra. The course is a good computational foundation for further courses in applied mathematics, computer science, physics, engineering, statistics, and other mathematical sciences.

Math 22a also serves as an introduction to mathematical proofs, which is the foundation of theoretical mathematics. The course will focus on understanding proofs in detail and constructing mathematical proofs on your own. After taking Math 22a and 22b, students will be prepared to take many proof-based mathematics courses at the level of a mathematics concentrator, and students will also be well prepared for theoretical courses where proofs are frequently used, for example in computer science, statistics, and physics.

Course format:

The course has a lecture format, with daily and weekly homework, some of which may be using an online computational homework system. Much of class time will be spent working together or in small groups to answer mathematical questions and discuss elements of mathematical proofs.

Typical enrollees:

No previous background in linear algebra or proof writing is required for Math 22a. Typical students have completed Math 1b or a similar level of preparation, for example BC calculus and Harvard placement into the 18a/21a category. Students should also be interested in learning about proofs. You can attend Math Department drop-in placement advising hours to get advice on which mathematics courses are best for you, see the following link for details:

<https://www.math.harvard.edu/undergraduate/placement-advising/>

When is course typically offered?

Math 22a is offered in the fall semester each year.

What can students expect from you as an instructor?

Mathematics is about doing! I expect students to actively participate in every class, practicing mathematics, discussing with the class and neighbors, and working through examples and proofs. Show up every day and be ready!

Math 22a is a fast-paced course, much like Math 21a and Math 21b. Given that we plan to cover the content of Math 21b and additionally learn to understand and write proofs, I expect that Math 22a will be a harder course conceptually than Math 21b. I am aiming for around 6-10 hours of homework per week, which is similar to Math 21b. I also recommend that students read the sections of the textbook that we cover in class, and while that adds some to the workload, it is an excellent way to learn.

Assignments and grading:

Math 22a will have roughly 12 weekly problem sets due during the semester. There will also be online homework through WebWork or Edfinity or a similar system. Math 22a will have 2 or 3 midterms, most likely one in September, October, and November; and a final exam in December scheduled by the registrar.

Sample reading list:

There are two required textbooks for Math 22a:

- *Book of Proof*, 3rd edition, by [Richard Hammock](#). This book is available free as a pdf [here](#).
- *Linear Algebra and Its Applications* (sixth edition) by David Lay, Steven Lay and Judi McDonald. (ISBN: 978-01358-5125-8). Note that there are multiple editions of *Linear Algebra and Its Applications* by Lay that are largely similar. You will likely be fine with an older edition, but if you have an earlier edition, be sure to double check that you do the correct exercise when they are assigned from the book, since the exercises are sometimes changed or renumbered between editions.

Enrollment cap, selection process, notification:

Math 22a is open to all interested students.

Past syllabus:

In Fall 2024, we will be following a similar course plan as in the past few years, for example as taught by Cliff Taubes in Fall 2023 ([syllabus](#), [calendar](#)).

I expect to have the two midterms be in class, which will require adjusting the lessons calendar a bit. I also expect to have some online homework as in 2022. Classes may also emphasize in-class participation more than in previous years. I also plan to use Ed Discussion or a similar system to manage class communication.

Absence and late work policies:

There are likely to be short, in-class participation assignments for most or all classes. In lieu of dropping one weekly written problem set, there is likely to be an on-line make-up assignment; and similarly for the weekly on-line homework.