

MTH 309 B: Introduction to Linear Algebra

Instructors

Lecturer: Mark Sullivan

Office: Mathematics building 131

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Office hours: Wednesdays, 10:00 AM ET - 12:00 PM ET (and by appointment)

Teaching assistant: Mark Sullivan

Prerequisite

MTH 142.

Meetings

August 29, 2022 - December 9, 2022

Lectures: Clemens 322

M, W, F, 9:00 AM ET to 9:50 AM ET

Recitations:

B1: Baldy 110

M, 10:00 AM ET to 10:50 AM ET

B2: Norton 214

M, 11:00 AM ET to 11:50 AM ET

Course description

From the Mathematics Department: “Linear equations, matrices, determinants, vector spaces, linear mappings, inner products, eigenvalues, eigenvectors.” We’ll also be using the Python programming language (through Jupyter Notebooks) to

introduce some of the ways in which linear algebra problems intersect with computing.

Textbook

The textbook for this course is free and open source. It can be found at the following address:

<https://tinyurl.com/mt92vjrn>

Learning outcomes

The Mathematics Department's guidelines for the course can be found on the sample syllabus, accessible at the following address:

<https://tinyurl.com/4r4ak7wj>

Assignments and grades

Homework will be assigned weekly throughout the course (with some exceptions; see the *weekly schedule* for details). These assignments will be posted on Gradescope. You will have (at least) one week to complete each assignment. Homework will account for 25% of your final grade.

There will be five **Quizzes** given before the Fall recess (see the *weekly schedule* for particular dates). The topic(s) of each quiz will be announced a week ahead of time, through an e-mail. These quizzes will be given during recitation. You will have thirty minutes to complete each of them. Quizzes will account for 15% of your final grade.

There will be **two exams** in the course. These exams will not be cumulative. Their dates can be found on the *weekly schedule*. The topics covered by the exam will be announced at the beginning of the week of the exam, through an e-mail. Each exam will account for 20% of your final grade.

There will be a **cumulative final exam** for the course. See *Final exam information* for more details. It will account for 20% of your final grade.

To summarize:

Homework:	25%
Quizzes:	15%
Exam 01:	20%
Exam 02:	20%
Final exam:	20%

The following system will be used to assign letter grades:

Letter Grade	Course Average x
A	$93 \leq x \leq 100$
A-	$90 \leq x < 93$
B+	$87 \leq x < 90$
B	$83 \leq x < 87$
B-	$80 \leq x < 83$
C+	$77 \leq x < 80$
C	$73 \leq x < 77$
C-	$70 \leq x < 73$
D+	$67 \leq x < 70$
D	$60 \leq x < 67$
F	$0 \leq x < 60$

A student who earns an F will be assigned a grade of F1, F2 or F3 based on their level of participation in academic class activities as follows:

F1: for a student who participated beyond the 60% point of the session.

F2: for a student who participated but stopped participating prior to the 60% point of the session.

F3: for a student who did not participate in the class.

Please keep in mind that your degree of participation may impact your eligibility for federal or state financial aid. Higher levels of participation ensure greater chances of retaining any financial aid received for this class. Questions regarding financial aid should be directed to a financial aid advisor.

Weekly schedule

A tentative schedule for this course's topics and assignments can be found at the following address:

<https://tinyurl.com/5n998wa5>

As you can see, the calendar contains information about when we will discuss specific topics in the lecture, when assignments will be due, dates of quizzes and exams, and important dates set by the registrar. The calendar will be updated when I deem it necessary to make changes. I will notify the entire class through an e-mail when such a change is made.

Upon request, I can provide a physical copy of the course calendar, but of course, it will not be automatically updated if changes are made.

Final exam information

There will be a cumulative final exam for the course, scheduled for the following time:

Wednesday, December 14, 2022, from 8:00 AM ET to 11:00 AM ET

(If you have a conflict or some other legitimate reason for which you cannot attend the final exam at this time, you **must** inform me immediately.)

Course policies

All important documents for the course (including this syllabus) will be found on our UB Learns page.

No outside resources will be allowed on quizzes and exams. The only things you'll be able to use during such an assessment are paper, writing instruments, and your nervous system. Use of any other resource (including calculators) is prohibited.

Discussing and collaborating with your classmates on homework problems is allowed. However, your submissions must be separate.

Late submissions to homework assignments will not be accepted, unless I specifically grant an extension. In order to get such an extension, you must contact me **before** the due date, and you must have a convincing reason.

If you miss a quiz or a test, then you will get no credit for that quiz or test, unless you contact me immediately about an excused and verifiable absence. In that case, I will make arrangements for you to make up the quiz or test **within one week** of its original date.

Gradescope will be used to distribute and grade homework assignments. You will be automatically added to our Gradescope course page on Wednesday, August 31st. If you joined this class after August 31st, then you will need to personally ask me to add you to our page.

Incomplete grades

If, at some point during the course, you have a passing course grade, but are unable to finish the remaining coursework by the official end date of the course (due to exceptional circumstances), then you may be eligible to receive a grade of "I." The "I" grade is a temporary placeholder. It allows the student more time to complete the coursework than the academic term would ordinarily allow. This requires the instructor to assess what assignments need to be made up, and to designate a deadline (less than 12 months) for the completion of these assignments. After this deadline, the "I" is replaced with an official grade for the course which considers all of the work the student has done from the beginning of the course up to the deadline. **In order for a grade of "I" to be assigned, the student must initiate a request for**

such an extension prior to the end of the term. Additional information about incompletes can be found here:

<https://catalog.buffalo.edu/policies/explanation.html>

Accessibility

Reasonable accommodations for equal access to this course because of disability should be requested through Accessibility Resources located at 60 Capen Hall, (716) 645-2608.

Academic honesty

The University at Buffalo's policy on academic honesty can be found here:

<https://catalog.buffalo.edu/policies/integrity.html>

All instances of academic dishonesty will be reported to the Academic Integrity Office.

To be frank, I really don't want to have to deal with this. If, during the course, I discover that you have not closely adhered to the university's policies, then you will get no sympathy from me. I will pursue the most severe punishment possible in that case. In short, **I assure you that it would be far better for you to fail the class honestly than to disobey the rules.**

Advice

This class is hard. I have worked with many students in this class before, and not one of them has ever expressed to me that they found this course easier than Math 141 or Math 142. It would therefore be reasonable to expect that it will be harder than those classes. So, I have some pieces of advice for handling the class.

1. There is exactly one way to improve your skill in mathematics, and it's to practice doing the types of problems that you're studying. For some reason, we humans simply cannot learn how to do an activity well just by being told how to do it, or by watching someone else do it. To believe that you can become better at mathematics by watching someone else do it is equally absurd as believing that you can become a pianist by watching someone else play the piano.

2. Confidence comes from familiarity. As a psychological corollary to the previous point, the only way to get over any anxiety that you might feel (especially in preparation for a test) is to become so familiar with the material that nothing could possibly surprise you. Think of any task that you feel you could easily do. Surely you didn't always think you could do it. So, how did you overcome your self-doubt?

3. Budget your time. This is important in general, but especially so for exams. Divide the amount of time allotted for an exam by the number of problems on the exam. This gives you a guideline for how long to spend on each problem. (It would also be wise to budget for some additional time at the end of the exam, in order to deal with any unexpected difficulties.)

4. Check your e-mail daily. At times, it may be necessary for me to make an announcement through an e-mail. I promise you that if these e-mails were not important to you, then I would not send them.

5. Don't hesitate to ask me for help. Educating you is my job, and I happen to love my job. If there's ever anything I can do to help you learn, let me know. Additionally, if you have any suggestions for how I should run the course, I'd be interested in listening to them.