

MATH 2270 - 006

Linear Algebra

Syllabus

Class: MoTuWeFr 09:40am -10:30am by Interactive Video Conferencing (i.e. live Zoom lectures)

Instructor: Ben Briggs

Office Hours: Ten minutes after every class. And also full office hours at a time to be determined.

Text: We will be following **Linear Algebra and its Applications, 5th edition, by Lay, Lay and McDonald**. I recommend that you get access to the book to help follow along, but you are not required to purchase a copy.

Canvas: Announcements and information will come through canvas, check at least twice a week. Grades will be posted on Canvas, please check these regularly too and let me know if I made any mistakes.

Email: You should contact me by email at briggs@math.utah.edu - in general I will be able to check my email during the day up to 6pm, and I'll try to get back to you by the next day

Gradescope: Homework and Exams will be dealt with using Gradescope. I will give you more information about this later.

What will class look like? This class is listed as IVC in the university catalog, which stands for Interactive Video Conferencing. This means that the class will be live and entirely online. We will meet on Zoom during class time, please make sure to be on time.

In class I will be doing some writing and talking (hopefully with you talking back), something like a normal lecture. During class I'll ask everyone to keep their microphones muted, but you can unmute yourself and interrupt me whenever you want. It's nicer for me (and everyone) if you have your video on! But you may turn off your video if you prefer.

I want class to be as interactive as possible. You can stop me and ask for worked examples, tangential questions, etc. We'll occasionally split into breakout rooms and work on problems in small small groups using jamboard. It's ok if you're not familiar with jamboard yet (but you can try playing around with it now).

If you don't have Zoom yet you can download it for free from zoom.us/download. You will need reliable access to a computer with stable internet connection, and with a webcam and microphone to fully participate in the class. If you're worried about this, please let me know and we can make arrangements.

Course Content: This course is a mixture of concrete/computational math and abstract/geometric math. On the concrete side we will work with vectors and matrices and use these to solve linear equations and real life problems. On the abstract side we will talk about vector spaces (like the 2D plane or 3D space) and linear transformations between them, and all of the geometry that goes on here. One of the most important things in the course will be learning how to translate between these two sides, and hopefully see it all as one big picture. There will be some proofs but not too many.

We'll cover **chapters 1–6** in the book, if you like reading along (but sometimes I'll do things slightly differently to the book). **Key topics:** • Linear systems of equations • Matrices • Solving linear systems with row reduction (i.e. Gaussian elimination) • Vector spaces • Subspaces, linear transformations • Bases and coordinates • Span, linear independence and rank • Products of matrices • Inverses of matrices and determinants • Eigenvectors, and eigenvalues • Orthogonal transformations, orthogonal projections • Gram-Schmidt orthogonalization

Course Structure:

Homework (40% of your score): Every other week on Wednesday a homework will be due (7 in total). The lowest homework score will be dropped.

You may work together on Homework (I encourage you to!) but you must always write up your solutions alone, in your own words. You will need to upload your solutions to gradescope before the deadline.

In Class Exams (40% of your score): There will be a 30 minute exam every other week, taken in class on Wednesday (6 in total). The lowest exam score will be dropped.

There will be time at the end of class to upload your solutions to gradescope.

Final Exam (20% of your score): There will be a one hour cumulative final on Monday, May 3 at 9-10am. You should arrange to be free at this time.

Extra Credit: If you make through the course without unexplained absences you get **1% extra credit**. It's okay if you need to miss a lecture, if you email me ahead of time and make sure to catch up on what you miss, you will still be eligible for the extra credit.

At the beginning of class I will ask one of you to quickly say what happened last time. If you do this at least once, you get **1% extra credit**.

What is Allowed: All exams will be **open book**, including the final. You are also allowed to access the internet as a tool for looking up definitions and extra information. You are **not** allowed to consult with other students during exams, and you are **not** allowed to use online tutoring or answer sites such as Chegg, TutorMe, Math.StackExchange etc. to obtain answers for exams or homework. These sites will be actively monitored, and they are actively cooperating with our university to investigate cases of potential fraud and abuse.

If you cheat on any exam or homework, I will give you a zero on that part of the course. Depending on the severity, I may decide to fail you from the class. In all cases of academic dishonesty, I will report the incident to the Dean of Students.

COVID Specifics:

Protocol in the Case of a Stay-at-Home Order: Should another stay at home order go into place the online nature of this course means that it should be mostly unaffected. However I can imagine that for some students a stay-at-home order may come with additional burdens, and if you are in this case please e-mail me and I will work with you individually to come up with solutions.

Protocol in the Case of Sickness: If I happen to get sick I will arrange an alternative instructor. Should one of you happen to get sick please let me know via e-mail and we will work out an arrangement for homeworks and exams. Remember that all students, faculty, and staff who are given a positive COVID diagnosis must self-report at coronavirus.utah.edu.

Spring Break: There is no spring break this year because of the pandemic. The semester is shorter because of this.

Other Important Things:

Student Responsibilities: All students are expected to maintain professional behavior in the classroom setting (including online!), according to the Student Code. Students have specific rights as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors (including online!), and I will do so. Students have the right to appeal such action to the Student Behavior Committee. <http://regulations.utah.edu/academics/6-400.php>

Student Names and Personal Pronouns: Class rosters are provided to the instructor with the student's legal name as well as Preferred first name (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS) so I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name on your UIDcard, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email bpeacock@sa.utah.edu to schedule a time to drop by. The LGBT Resource Center hours are M-F 8am-5pm, and 8am-6pm on Tuesdays.

Undocumented Student Support: Immigration is a complex phenomenon with broad impact—those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801.213.3697 or visit dream.utah.edu.

The Americans with Disabilities Act: The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability & Access, 162 Olpin Union Building, 801-581-5020. CDA will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability & Access.

Wellness Statement: Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at www.wellness.utah.edu or 801-581-7776.

Addressing Sexual Misconduct: Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted on the basis of your sex, including sexual orientation or gender identity/expression, you are encouraged to report it to the University's Title IX Coordinator; Director, Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or to the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to police, contact the Department of Public Safety, 801-585-2677(COPS).

Campus Safety: The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu

Note: This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas.

Important dates:

Week 1 Wednesday, January 20 - first day of class!

Week 2 Wednesday January 27 - Homework 1 is due
Friday, January 29 is the last day to drop

Week 3 Wednesday February 3 - Exam 1

Week 4 Wednesday February 10 - Homework 2 is due

Week 5 Wednesday February 17 - Exam 2

Week 6 Wednesday February 24 - Homework 3 is due

Week 7 Wednesday March 3 - Exam 3

Week 8 Wednesday March 10 - Homework 4 is due
Friday, March 12 is the last day to withdraw

Week 9 Wednesday March 17 - Exam 4

Week 10 Wednesday March 24 - Homework 5 is due

Week 11 Wednesday March 31 - Exam 5

Week 12 Wednesday April 7 - Homework 6 is due

Week 13 Wednesday April 14 - Exam 6

Week 14 Wednesday April 21 - Homework 7 is due Friday, April 23 is the last day to reverse CR/NC option

Week 15 Tuesday, April 27 - Last day of class!

Final exam Monday May 3 at 9-10am