

## MATH 2270 - LINEAR ALGEBRA

**Instructor:** Adam Booher  
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**Office:** LCB 112  
**Website:** *Canvas*

**Class:** MWF 12:55- 1:45 WEB L110  
T 12:55 - 1:45 WEB L102

**Office Hours:** to be held in my office, LCB 112. Tuesday 11:00am - 12:00pm and Friday 2:00 - 3:00pm

**Textbook:** David C. Lay, Stephen R. Lay & Judi McDonald, Linear Algebra and its Applications, 5th. ed., Pearson, 2015.

**Important Dates:**

**Midterm 1** February 12 In class  
**Midterm 2** March 11 In class  
**Midterm 3** April 8 In class  
**Final** April 28 1:00 - 3:00 pm  
(Exam dates are tentative at the moment)

**Description:** This course will cover the basic theoretical and computational aspects of linear algebra. Linear algebra is perhaps the most important subject for most modern day computations. Anytime you deal with large amounts of data (say in looking at an image on a computer) linear algebra is precisely the language that gives you tools to efficiently store and read it. At the same time, linear algebra is also one of the most beautiful pure math courses that you will take. It is chock-full of definitions, easy theorems, harder theorems, and proofs. In this course we will equally study the applications as well as the theory. You won't be asked to prove hard theorems on exams, but you'll be expected to know definitions, carefully parse mathematical statements, and perform basic demonstrations that you understand key concepts. We'll do plenty of these types of problems on the homework as well.

For those who like lists, we will learn about: Euclidean spaces, linear systems, Gaussian elimination, determinants, inverses, vector spaces, linear transformations, quadratic forms, least squares and linear programming, eigenvalues and eigenvectors, diagonalization.

Some of the homework will be supplemented with computer problems. My view on technology is that you should use technology whenever it can help you solve a problem, but only once you understand how to solve the problem by hand. On the exams, calculators/computers/cell-phones will not be allowed. The same policy is in effect for quizzes that we will have approximately every week.

**Grading Policy:** Your grade will be determined based on

- Homework and graded worksheets 20%
- Weekly quizzes 15%
- Midterm 1 15%
- Midterm 2 15%
- Midterm 3 15%
- Final Exam 20%

Late homework will not be accepted, and in general we won't hold make-up quizzes, as it is important to keep moving forward in the course. However, I will drop the lowest quiz and homework grades, and special circumstances will be considered on a case by case basis. If you know you will miss a quiz/homework/exam, please contact me *in advance* so plans can be arranged.

**Strategies for Success:** This class will be challenging - it will start with some basic computations, but we'll soon advance to learning definitions and making more abstract statements about vector spaces. Don't underestimate the importance of learning the definitions solidly! Homework is a significant part of your grade. This reflects its importance in learning. Working in a study group is strongly encouraged - and you are encouraged to submit your write-ups as a group. If you work with the same group throughout the semester, I'll ask you to take turns writing up the solutions.

Finally, I find that daily practice is the best pathway to success in a number of areas - consider music, meditation, yoga, etc. Consider making a commitment to think about mathematics on your own each day. Most days this will mean reading the textbook or working on homework. But if you find yourself busy with life's other demands, even five minutes of thinking "What was it we did in class the other day?" will do wonders.

Students often ask about extra credit. There will be exactly one opportunity for extra credit - (which will be worth 5 exam points added to your lowest midterm score). The extra credit will be in the form of a short term paper or presentation about an advanced topic that we won't have time to cover in the course. More information will be available after the 2nd midterm.

**Academic Integrity:** All University of Utah policies regarding ethics and honorable behavior apply to this course.

#### **Resources for you:**

**1.) ADA:** The University of Utah is fully committed to affirmative action and to its policies of nondiscrimination and equal opportunity in all programs, activities, services, and employment without regard to race, color, national origin, sex, age, disability, gender identity/expression, religion, sexual orientation, and status as a protected veteran. The University seeks to provide equal access to its programs, services, and activities for people with disabilities. Reasonable prior notice is needed to arrange accommodations. Evidence of practices not consistent with these policies should be reported to the University's Title IX/ADA/Section 504 Coordinator: Director, Office of Equal Opportunity and Affirmative Action, 201 S Presidents Cr., Rm 135, Salt Lake City, UT 84112. 801-581-8365 (V/TDD).

**2.) Wellness Center:** Are you concerned about stress, sleep difficulties, anxiety, depression, cultural differences, relationship difficulties, balancing work and school, or finances? Would you like to perform better in class, help a friend in distress, or learn more about physical activity or nutrition? Contact the Center for Student Wellness; [wellness@sa.utah.edu](mailto:wellness@sa.utah.edu); [www.wellness.utah.edu](http://www.wellness.utah.edu); 801-581-7776.

**3.) Veterans:** If you are a student veteran, I want you to know that the U of Utah has a Veterans Support Center on campus. Please visit their website for more information about what support they offer, a list of ongoing events and links to outside resources: <http://veteranscenter.utah.edu/>. Please also let me know if you need any additional support in this class for any reason.

**4.) LGBTQ:** If you are a member of the LGBTQ community, I want you to know that my classroom is a safe zone. Additionally, please know that the U of Utah has an LGBT Resource Center on campus. You can visit their website to find information about the support they can offer, a list of events through the center and links to additional resources: <http://lgbt.utah.edu/>. Please also let me know if you need any additional support in this class for any reason.

**5.) Mathcenter:** There is free tutoring available at the Math Tutoring Center, located in room 155 of the T. Benny Rushing Mathematics Center (adjacent to the LCB and JWB). To let the tutors know that you need help, simply put up one of the flags. If you find that you'd prefer more personalized attention than our tutoring center can give, try the ASUU Tutoring Center (7 dollars an hour), 330 SSB, or pick up a private tutor list from the math department office (233 JWB). For more information look here: <http://www.math.utah.edu/ugrad/mathcenter.html>.