

Math 240: Linear Algebra

Fall 2018 Syllabus

INSTRUCTOR: Dr. Hundley

OFFICE: Olin 222

OFFICE HOURS: Mondays and Fridays by appointment (drop me an email). Tuesday I'll have office hours at 9AM, then Wednesdays at 3 and Thursdays at 1. My office hours are also posted online and on my office door.

If you can't meet during office hours, you may drop by any time my office door is open, or we can always arrange other times to meet (email is probably fastest way to get in touch with me).

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1. **Text:** Linear Algebra and its Applications, by David C. Lay, **Fourth Edition**.

As time allows, we will be covering topics from Chapter 1, 2.1-2.4, 3.1-3.3, 4.1-4.7, 5.1-5.5, 6.1-6.7.

2. **Technology:** You are allowed to use calculators on your homework, where appropriate. Calculators will *not* be allowed on exams, however. This is (1) to ensure that points are not based on what kind of calculator you own, and (2) because one goal of the course is that you understand basic computations in linear algebra. We will be using Matlab (or its free version, Octave)- More information on that later.

3. **Grading Criteria.**

- (a) HOMEWORK will be assigned daily, and picked up the day after.

Solutions to your homework should:

- be neatly written out.
- include a statement of the problem.
- be written in complete sentences.

Where appropriate, you should end the problem with a statement of the solution (or, if its a straightforward computation, circle your answer). As a rule of thumb, you should be able to pick up your paper and follow your work from start to finish without having to refer to the text.

LATE WORK: Please don't be late! If you are late, points will be taken- on a 10 point scale, it would be a half point per day, with a maximum of 10 days (inc holidays and weekends), or until the first exam after the work was due.

The overall homework grade will be 15% of the overall grade. NOTE: After the first exam, we will assess how the homework assignments have been working out, and we may go to a weekly quiz.

- (b) MATLAB programs will be assigned weekly to give you a chance to implement the theory and to compute using larger arrays. Overall, the Matlab programming will constitute 5% of the overall score.

- (c) EXAMS. There will be three exams: **Tues, Sep 18** and **Tues, Oct. 16** and **Thurs, Nov 15**. The material on the exam may change, but the dates for the exams will not. Each exam is worth 20% of the overall class grade.

There will be a comprehensive final exam given at the time published by the Registrar's office. The final exam will be worth 20% of your overall grade.

If you do well on your final exam, I will replace your lowest exam score by the average between it and the final exam score.

GRADING: Grading is done on a standard scale:

$$\begin{array}{llllll} A = 92 - 100 & A- = 90 - 91 & B+ = 88 - 89 & B = 82 - 87 & B- = 80 - 81 \\ C+ = 78 - 79 & C = 72 - 78 & C- = 70 - 71 & D = 60 - 69 & F = 59 \text{ and below} \end{array}$$

4. **Collaboration:** You are encouraged to discuss homework assignments with other students and you should form study groups. However, **the solutions you turn must be your own.**
5. **Assistance:** I encourage you to come see me. If you can't make it during office hours, either email me if you have short questions, or let me know when you would like to meet.
6. **Health problems.** If you're having to miss class due to health problems, you need to get in touch with me as soon as possible, either by phone or email. If you are ill on the day of an exam, we can work out other arrangements for you **only** if you receive verification from a health professional (i.e., go to the clinic and get checked out). You can then have the Dean of Student's office send a message to that effect to me- I don't need to know any details, just that you have gone through the procedures. This includes mental health problems, as well as chronic conditions.
7. **Other Absences.** If you need to miss class due to other legitimate reasons (religious holidays, sports, etc), please let me know ahead of time so that we can work around your schedule.
8. **Learning Disabilities.** If you have a learning disability, we can make the proper arrangements for you. All arrangements need to go through the Academic Resource Center *prior* to taking an exam. (This also applies generally: If you're having academic difficulties, see the people at Academic Resources!)
9. **Academic Honesty.** Academic standards will be *strictly* adhered to as outlined in your student handbook. This means that cheating will not be tolerated. Looking at another student's exam or quiz (whether or not you mean to copy answers) while taking it will be considered cheating. Students caught cheating will fail the exam or quiz, and the incident will be referred to the Dean of Students, as outlined in your student handbook.
10. As a courtesy to me and your fellow classmates, please silence your cell phone and refrain from using any kind of electronic device during class. Exceptions can be made, but please speak with me in advance.

I would like to create a learning environment for you that supports a diversity of thoughts, perspectives and experiences. To help accomplish this:

1. If you have a name and/or set of pronouns that differ from those that appear in your official College record, please let me know (feel free to send me an email if that's easier for you).
2. If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. I want to be a resource for you. Remember that you can also submit anonymous feedback. Also, the Academic Resource Center has a great staff that are there to help you as well.
3. I (like many people) am still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please talk to me about it. (Again, anonymous feedback is always an option).

Learning Goals

Upon successful completion of Math 240, students will:

- Solve systems of linear equations. Be able to discuss the general situation and conditions under which we expect each type of solution. Discuss solutions in terms of the “four fundamental subspaces”.
- Analyze vectors geometrically and algebraically.
- Understand the basic terms in linear algebra, including such things as: span, linear independence, basis, dimension, vector space, subspace.
- Understand how geometry works in higher dimensional space (in terms of angles, orthogonality, and distance).
- Understand the relationship between matrix algebra and linear transformations.
- Understand and use determinants.
- Be able to implement theory using a provided software package (like Matlab). Be able to visualize high dimensional data in different ways.