

Math 341 --- Linear Algebra

Class Meetings: 251 STB, Mon-Tue-Wed-Fri, 1:00-1:50pm

Instructor: Drew Johnson

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Office: Deady Hall, 1B (basement)

Office phone: 541-346-5216

Office hours: Will be announced on Canvas and in class.

Final Exam Date: 2:45pm, Tuesday, December 5

Textbook: *Linear Algebra and its Applications*, by Lay, Lay, and Macdonald, 5th Edition. We will cover approximately Chapters 1-4. The electronic resources that come with the book will not be required this term, although they may be useful as supplements.

Other resources and links will be posted on Canvas.

Canvas: I will be using Canvas for class communication. Please be sure that you have your settings so that you are notified about class announcements.

Grading: You grade will be weighted as 25% Homework, 20% each for two midterm exams, and 35% for the final exam. You are guaranteed a grade at least as good as the standard cutoffs: 100-97: A+, 97-93: A, 93-90: A-, 90-87: B+, 87-83: B, 83-80: B-, etc. If needed, I will make the cutoffs more generous to match our class average with historical data.

Homework: Homework will usually be assigned from the textbook (though I may occasionally assign some special problems) and will be due in class on Tuesdays. The assignment will be posted on Canvas. Typically the homework will cover the topics we discussed up through Wednesday the previous week in class.

I will drop your lowest homework score, and you are additionally allowed one late assignment with no questions asked. Further accommodation must be arranged with the instructor.

You are encouraged to work with other students on the homework. Each student must turn in his/her own work. You need to be prepared to solve problems independently on exams.

The grader will check some answers and check the rest for completion. You are responsible to make sure you understand the homework.

Exams: There will be two midterm exams in class on Friday, October 20 and Friday November 17. If you are unable to come to the midterm exams, you must notify the instructor *in advance* (or as soon as possible in the case of an emergency) to make arrangements.

The Final Exam will be comprehensive, with an emphasis on the material of the last two weeks that didn't make it on the midterms. The Final Exam can only be rescheduled in case of an emergency. It will not be given early. Please be sure to arrange your travel schedule to be there!

Calculators/Computers: You are allowed/encouraged to take advantage of electronic resources to check your answers or help your understanding on the homework. I will post some possible links. Do not use a computer to trivialize the problem---answers with no work shown when that work was the whole point of the

problem will not receive credit. ***Calculators/computers/phones will NOT be allowed on the tests.*** I will make sure that test questions are manageable without electronic assistance.

Getting help: You can come talk to me in office hours. There is free drop in tutoring at the Knight Library. Also, small group and private tutoring are available. See <http://tlc.uoregon.edu/subjects/math/>.

The Math Library in Fenton Hall also offers drop in homework help. See <http://library.uoregon.edu/scilib/mathlib>. (Not all the tutors may be qualified for linear algebra, though...)

Disability Accommodation: The University of Oregon strives for inclusive learning environments. Please notify me if the instruction or design of this course results in disability-related barriers to your participation. In most cases, special accommodations should be arranged with Accessible Education Center in 164 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu. Do this *in advance* of any exams.

Classroom Environment: I expect students to show respect for each other and the instructor and refrain from any behaviors that may be distracting or disruptive. Please do not use cell phones during class time.

Academic Misconduct: The code of student conduct and community standards is at conduct.uoregon.edu. It is not appropriate to help each other on exams, to look at other students' exams, or to bring unauthorized material to exams. In the event of academic dishonesty, the offense will be reported to the Office of Student Conduct and Community Standards and the student will be sanctioned up to receiving a failing grade in the course.

Learning Outcomes:

Math 341 begins with the study of solving systems of linear equations by manipulating vectors and matrices. Then it introduces properties of matrices including operations, existence of an inverse, and determinants. The main goal is the introduction of vector spaces and linear transformations defined by matrices. A successful student in this course should have an understanding of the following concepts.

1. Find the general solution of a system of linear equations using row reduction.
2. Express a system of linear equations as a matrix equation.
3. Determine if a set of vectors in \mathbb{R}^n is linearly independent or linearly dependent.
4. Find the determinant of a matrix by using a cofactor expansion or by performing row operations.
5. Understand the definitions of vector space, subspace, basis, and dimension.
6. Understand how to convert a spanning set for a subspace into a basis for the subspace.
7. Determine if a vector lies in a span.
8. Find the dimension of a span.
9. Find the coordinates of a vector with respect to a basis.
10. Find the null space and range of a linear transformation.