Math 341 **Elementary Linear Algebra I** **Fall 2021**

9:00-9:50am; MTWF 307 University Hall

Instructor: Jennifer Thorenson

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Office: M110 University Hall (My office is on the first mezzanine floor by the elevator.)

Office Phone: 541-346-4711

Office Hours: Monday and Wednesday at 10-11am, Friday at 11-12pm or by appointment.

Textbook: *Linear Algebra and Its Applications*, 5th edition, David C. Lay, Steven R. Lay, and Judi J. McDonald.

Prerequisite: C- or better in Math 252.

Homework: Homework will be due at the beginning of class every Tuesday starting the second week of class. The assignments can be found on the canvas page for the class. Late homework assignments will not be accepted.

Homework must be written up neatly including all details and work towards a solution. A correct final answer without sufficient supporting work will receive little or no credit. Submitting a first draft that is incomprehensible or includes scratch work will not be tolerated as it increases the time needed to grade the assignment. Finding solutions to the homework from an additional source (the internet, for example) and submitting those answers as your own is cheating which will result in a report to the University for academic dishonesty.

Quiz: There will be four quizzes during the term. These quizzes will be in class on the dates of October 15, October 29, November 12, and November 24. Quizzes cannot be taken outside of the scheduled class time unless a valid reason for not attending the scheduled time is provided.

Exams: There will be two midterm exams administered during the scheduled class time; the first exam is on October 22 and the second exam is on November 19. The final exam is cumulative and is scheduled for 10:15-12:15pm on Friday, December 10, in our regular classroom, 307 University Hall. Exams can only be taken other than the scheduled time if arrangements are made in **advance** and a valid and admissible reason for not attending the scheduled time is provided. However, the final exam will not be administered early.

Grade: The final grade will be based on quizzes (10%), homework (20%), midterm exams (20% each) and the final exam (30%). Based on the following table, you are guaranteed to earn at least that grade, but grades may be adjusted at the end of the term depending on the outcomes of the course.

Percentage	Grade	Percentage	Grade	Percentage	Grade
90-92%	A-	93-96%	A	97-100%	A+
80-82%	B-	83-86%	B	87-89%	B+
70-72%	C-	73-76%	C	77-79%	C+
60-62%	D-	63-66%	D	67-69%	D+
0-59%	F				

Learning Environment: 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. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu.

Classroom Environment: Disruptive behavior in the classroom will not be tolerated. Leaving class early or arriving late, unless by prior agreement with the instructor, is considered disruptive behavior. All cell phones and music players must be turned off during the class period.

Calculator and Electronic Device Policy: Calculators are not required for this course but students are encouraged to use calculators and computers as educational aids. However, calculators and other portable electronic devices (laptops, tablets and cellphones) cannot be used during exams.

Academic Misconduct: The code of student conduct and community standards is at conduct.uoregon.edu. In this course, it is appropriate to help each other on homework as long as the work you are submitting is your own and you understand it. It is not appropriate to copy homework solutions from another student, to copy solutions from the internet or the text book's solutions manual. 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.

Tentative Schedule

We will cover most of chapters 1-4 during the course.

Week 1	1.1-1.3	Week 6	3.2-3.3, 4.1
Week 2	1.4-1.6	Week 7	4.1-4.3
Week 3	1.7-1.9	Week 8	4.4 (exam 2)
Week 4	2.1-2.2 (exam 1)	Week 9	4.5-4.6
Week 5	2.3, 3.1-3.2	Week 10	4.6, review

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 whether a set of vectors in $\mathbb{R}^n$ is linearly independent or linearly dependent.
4. Use row operations to determine if a square matrix is invertible and then find its inverse when it exists.
5. Find the determinant of a matrix by using a cofactor expansion or by performing row operations.
6. Understand applications of the determinant including determining if a square matrix is nonsingular and the geometric implications for vectors in $\mathbb{R}^2$ and $\mathbb{R}^3$.
7. Understand the definitions of vector space, subspace, basis, and dimension.
8. Understand how to convert a spanning set for a subspace into a basis for the subspace.
9. Determine if a vector lies in a span.
10. Find the dimension of a span.
11. Find the coordinates of a vector with respect to a basis.
12. Find the null space and range of a linear transformation.