

Math 341: Linear Algebra I

Fall 2018

(Section 10, CRN 10305)

Course Credits: 3

Lectures: 2:00 - 2:50 PM on Monday, Wednesday, Friday at Bexell Hall 207.

Instructor: Tuan Pham

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Course website: <http://people.oregonstate.edu/~phamt3/Courses/F18-Math-341/F18-Math-341.html>, materials will be posted on Canvas as well.

Office: Kidder 268, **phone:** 541-713-6196

Office Hours:

Monday 3:00- 3:50 PM, Kidder 268

Wednesday 3:00- 3:50 PM, Kidder 268

Friday 1:00- 1:50 PM at Kidder 268, and 3:00- 4:00 PM at Kidder 108J (computer lab).

Textbook: “*Lecture Notes on Linear Algebra*” by David Lerner. It is free and downloadable at: <http://www.math.ku.edu/~lerner/LANotes/LANotes.pdf>. Our lectures will not strictly follow the textbook.

Course Description: Matrix algebra, determinants, systems of linear equations, subspaces, an introductory study of eigenvalues and eigenvectors.

Math 341 Learning Outcomes: A successful student in MTH 341 will be able to:

1. Use Gaussian elimination to determine the solution set of a system of linear equations, and describe the solution set.
2. Perform matrix operations, including finding the inverse or showing no inverse exists for a square matrix.
3. Calculate determinants of square matrices and apply properties of determinants to draw conclusions about solution sets of linear equations and invertibility of matrices.
4. Find and use the matrix representation of a linear transformation associated to the standard basis in Euclidean space \mathbb{R}^n .
5. Use the definition to determine whether a subset of \mathbb{R}^n is a subspace.
6. Determine if a collection of vectors is linearly independent or dependent, and find the span of a set of vectors.
7. Use the rank-nullity theorem to draw conclusions about solution sets to linear systems and the invertibility status of square matrices.

8. Determine a basis for and the dimension of a given subspace, including the null space and column space of a matrix and the eigenspaces of square matrices.

Topics covered:

- Solving systems of linear equations by Gaussian Elimination.
- Matrix operations, conditions for invertibility
- Determinants.
- Definition of linear transformation and its connection with matrices.
- Subspaces of \mathbb{R}^n , linear independence, span, basis, and dimension.
- Row space, column space, null space, rank-nullity theorem.
- Eigenvalues and eigenvectors.

Grading:

Homework: 20%

Quizzes: 10%

Lab reports: 10%

Midterm: 25%

Final Exam: 35%

Homework: due on Friday each week, except for the last week, at the beginning of class.

Purpose: Attempting to solve these problems is an important part of understanding what you are learning.

Policy: Late homework will not be accepted. Turn in what you have completed by the due date.

Quizzes: every Wednesday at the beginning of class, starting from the second week.

Purpose: Check your understanding of the topics covered since the previous quiz.

Policy: There are no make-up quizzes.

Lab reports: due on Friday every even week, starting from the second week, at 11:59 PM on Canvas.

Purpose: The lab component is to help you be familiar with mathematical software (MATLAB) to do computations on matrices (and more). You can download MATLAB with OSU's license to your personal computer from here: <https://is.oregonstate.edu/service/software/matlab>. If you are unable to install it, you can use computers at the lab room Kidder Hall 108J almost anytime from 9 AM to 4 PM, Monday through Friday.

Policy: Your reports should be in the format of word document or PDF.

Midterm Exam: in class, on Friday 10/26.

Policy: Calculators are allowed. However, some problems may ask you to write detail steps (for example in finding RREF of a matrix). Cellphones, laptops or other electronic devices are not allowed. Exams cannot be rescheduled or taken early. Any regrading request must be addressed within one week after the work being returned to you. There will be no make-up exam.

Final exam: Noon, Wednesday 12/5, 110 minute long. Room to be determined.

Policy: If you have exam conflicts, you should email me in advance.

Grade lines: the course grades will not be harder than: A 100-90%, B 89-80%, C 79-70%, D 69-60%, and F 59% and under. You can view your scores on Canvas. The running total that canvas provides may not be accurate. I will calculate final course grades at the end of the term.

Other Learning Resources: The Math Learning Center MLC in Kidder 108 is a great place to drop in for help. It's open from 9am to 4 pm M-F from the second week of classes through the end of dead week.

Academic Honesty

OSU's Statement of Expectations for Student Conduct: http://studentlife.oregonstate.edu/sites/studentlife.oregonstate.edu/files/code_of_student_conduct.pdf

Statement Regarding Students with Disabilities

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.