
Math 341, Spring 2024, Unique Nr. 54315

Linear Algebra and Matrix Theory

TuTh 11:00am-12:15pm, PMA 10.176

Instructor: Dr. Dominic Wynter

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Office hours: MW 4-5pm, PMA 9.138

Course text: *Elementary Linear Algebra*, by Stephen Andrilli and David Hecker, 6th edition.

Course Description. This course covers a variety of topics in linear algebra and matrix theory, and is intended to help develop skills at constructing and writing mathematical proofs. Specific topics covered include vectors and matrices, systems of linear equations and Gaussian elimination, eigenvectors and eigenvalues, determinants, vector spaces and linear transformations, bases and linear independence, and orthogonality.

Course Outcomes. By the end of the course, students are expected to be able to understand vectors, solve linear systems of equations, understand the solution set in algebraic and geometric ways, compute determinants, compute eigenvalues and eigenvectors of a matrix, find bases and dimensions of vector spaces, and find distances, projections, and orthogonal bases of subspaces. Students will also learn to understand and write simple mathematical proofs, and apply various proof techniques.

Prerequisites. M408D, M408L, M408S, or the equivalent, with a grade of at least C-, or consent of the instructor.

Course Website. You will find a detailed schedule, homework assignments, and other course materials at: https://web.ma.utexas.edu/users/dlw3946/teaching/m341_spring25

Homework. There will be 11 homework assignments, due every Thursday, to be submitted through Gradescope. Assignments consist of proving theorems, answering questions, and solving exercises from the textbook. Late homework will not be accepted. Both the quality and correctness of your work will be graded. In particular, proofs should be written in full sentences. This is the norm among professional mathematicians — furthermore, this will help you organize your reasoning, and will lead to cleaner and more correct proofs, which will also be much easier to understand for others. Using technical symbols should be avoided when writing proofs.

You should write your solutions up neatly before the homework is due, and upload a .pdf of your work to Gradescope before the class begins.

The lowest 2 homework grades will be dropped — this is to accommodate occasions when you may not be able to submit assignments on time. You should still write up answers to the problem sets that you miss for your benefit, and I will assume when writing the exams that you have a complete understanding of all the assignments.

The assignments are to be completed individually, but you are allowed to discuss the problems with your classmates. Submissions should always represent your own work, and, of course, should never simply be copied from someone else's paper. If you learn a substantial part of the idea of a problem from someone else, please note this fact on your submission.

Quizzes (participation). There will be 10 quizzes, every Tuesday in class, except for the first and last weeks of the course, and excluding weeks with exams. Anyone answering all questions will get full credit. The purpose of the quizzes is to give feedback to the instructor. They are also intended to encourage attendance, since they will only be given in class. Since anyone may experience extenuating circumstances that make it impossible to attend class, the lowest two grades will be dropped.

Exams. Exams are closed book, and will take place in person. There will be two midterms and one final. Calculators and other electronic devices are not allowed during exams.

Exam 1: Tuesday, 2/25 in class (11-12:15pm, PMA 10.176)

Exam 2: Tuesday, 4/15 in class (11-12:15pm, PMA 10.176)

Final Exam: Friday, 5/02 from 3:30-5:30pm, at CPE 2.212

Grading.

- 10% for 10 quizzes (lowest two scores dropped) and for submitting course evaluations (2%)
- 18% for 11 problem sheets (lowest two scores dropped)
- 20% each for both midterm exams
- 32% for the final exam

Concerns. If concerns of any kind arise over the course of the semester, please let me know. If some aspects of the course delivery are not working well, it is helpful for me to know this early in the semester.

Make sure you are available during the exam times posted. If these conflict with any religious holidays or other foreseeable events, then please let me know at the start of the semester.

Importantly, if you fall behind, or find it hard to follow along, or if any other issues arise that make it difficult to do well in the course, then don't hesitate to make use of office hours, and please let me know early!

Additional resources. In case it is helpful, free one-on-one tutoring for this course is offered by the Sanger Learning Center: <https://undergradcollege.utexas.edu/student-success/sanger-learning-center/academic-support/one-one-tutoring>

Deadlines for dropping a course. The last day to drop the course without permission is January 29, 2025. The last day to drop the course for academic reasons is April 16, 2025. After this date, students may go to the Dean's Office to request a drop for urgent non-academic reasons.

Classroom expectations:

Students are expected to attend and actively participate in all class meetings. If you do have to miss a class, please contact a classmate to get notes and information from the missed class. (In fact, collaborating with your classmates or forming study groups is highly encouraged!) Note that 10% of your grade comes from in-person quizzes; missing more than two of these may adversely impact your final score.

Students are expected to arrive on-time and prepared to actively participate in the class. We are all expected, of course, to uphold The University of Texas at Austin Honor Code (<https://deanofstudents.utexas.edu/conduct/standards-of-conduct.php>) in all settings, all modes of communication, and all interactions with each other (assignment submissions, class meetings, email communications, etc.)

Artificial intelligence. The use of artificial intelligence tools (e.g. ChatGPT) for course submissions is strictly prohibited. This includes using AI to solve problems, or generate ideas for solving problems. All work in this course must be your own, or group work when specifically indicated.

Accessible/Compliant Statement. If you are a student with a disability, or think you may have a disability, and need accommodations please contact Disability and Access (D&A). You may refer to D&A's website for contact and more information: <http://disability.utexas.edu/>. If you are already registered with D&A, please deliver your Accommodation Letter to me as early as possible in the semester so we can discuss your approved accommodations.