MAT-150: Linear Algebra

Fall 2017

We share a philosophy about linear algebra: we think basis-free, we write basis-free, but when the chips are down we close the office door and compute with matrices like fury.

Irving Kaplansky

Instructor:	Thomas R. Cameron	**Time:**	M,W,F 9:30 – 10:20 am
Email:	thcameron@davidson.edu	**Place:**	CHAM B027 (classroom) LIB B110 (lab)

Course Page: https://www.thomasrcameron.com/pages/MAT-150/mat_150.php
Office Hours: M,W,F 2:30 – 4:00 pm, Tu 10:30 am – 12:00 pm, and by appointment in CHAM 3044.

Textbook: Lay, Lay, and McDonald, *Linear algebra and its applications, (5e)*, Pearson, 2016.
Technology: Mathematica (student download instructions)
Prerequisite: Calculus 2 (including by AP Credit)

Course Description: This course will introduce and apply important concepts in linear algebra, including: vector spaces, linear transformations, determinants, matrices, eigenvalues, orthogonality, and the numerical range. Every other Friday we will switch between a lab day and homework being due. Also, on a regular basis there will be in class assignments (EFYs) that will be collected that day or the following class period.

Learning Outcomes: Students will be able to

- Solve systems of equations by hand using Gaussian elimination and back-substitution, describe the solution set, and understand the standard algorithm behind computer routines for solving matrix equations.
- State, interpret, and apply key definitions and theorems, including: the invertible matrix theorem, the rank nullity theorem, vector subspace, linear independence, spanning set, basis, dimension, linear transformation, determinant, eigenvalue, eigenvector, orthogonality, projection, and the numerical range.
- Program in Mathematica to explore linear algebra concepts and their applications.
- Prove major theorems in our test using foundational definitions and results.

Grading Policy:
Your final grade is broken up as follows.

Category	Percentage
Lab	10%
EFY	15%
Homework	25%
Midterm Review	25%
Final Review	25%

Your final letter grade is based on the following scale.

Grade	Percentage Interval	Grade	Percentage Interval
A	$[93, 100]$	C+	$[76, 80)$
A-	$[90, 93)$	C	$[73, 76)$
B+	$[86, 90)$	C-	$[70, 73)$
B	$[83, 86)$	D+	$[66, 70)$
B-	$[80, 83)$	D	$[63, 66)$
		F	$[0, 63)$

Lab: Every other Friday we will meet in the lab room and explore important concepts from linear algebra and their applications. Lab notebooks are posted online in advance. Students are expected to work through the lab notebook examples, complete the assignment notebook, and turn in a printed copy of the assignment. You may work with anyone you wish and even use online resources to complete your lab, but turn in your own work.

EFY: Exercises For You will be given during each class period. Students will work on these exercises in groups, but turn in their own work. Each EFY can be turned in that day or the following class period. I will drop your three lowest scores.

Homework: Every other week homework assignments will be due that include a large range of problems that will test the students ability to prove theorems, solve problems, and think abstractly. These assignments are posted online two weeks in advance, and are due in class. Students are expected to engage in conversations with one-another regarding the assignment, but should not copy eachothers work.

Midterm: On October 6 students will be given a midterm that will test their understanding of the concepts covered up to that point. Students will work on the midterm independently at their leisure over the week, for no more than 3.5 hours, and turn it in during class on October 13.

Final Review: The final will test the students on a comprehensive selection of topics from the course. The test will be administered via Davidson's self scheduled exam system.

Academic Honesty: Students are expected to complete all graded work in accordance with the Davidson College Honor Code, as it applied to each assignment in this class.

Special Accommodations: Davidson College values the diversity of its community and is an equal access institution that admits otherwise qualified applicants without regard to disability. The college seeks to accommodate requests for accommodations related to disability that are determined to be reasonable and do not compromise the integrity of a program or curriculum. To make such a request or to begin a conversation about a possible request, please contact Beth Bleil, Director of Academic Access and Disability Resources, in the Center for Teaching and Learning by visiting her office in the E.H. Little Library, by emailing her at bebleil@davidson.edu, or by calling 704-894-2129. It is best to submit accommodation requests within the drop/add period; however, requests can be made at any time in the semester. Please keep in mind that accommodations are not retroactive.

Disclaimer: I reserve the right to diverge from this syllabus in the best interest of the course. Any changes made will be announced.