MTH 2775: Linear Algebra

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Catalog Description. Study of general vector spaces, linear systems of equations, linear transformations and compositions, eigenvalues, eigenvectors, diagonalization, modeling and orthogonality. Provides a transition to formal mathematics.

Prerequisites: MTH 1555 (Calculus II)

Textbook: No textbooks are required. Typed lectures will be provided in the following link: Linear Algebra Lectures
There are many books freely available on the internet. My favored ones are the following:

- Linear Algebra with Python, Springer (2024)

Course objectives: A student who successfully completes this course will be able to:

(1) To understand the foundations of the geometry in space: vectors, dot and cross product, equations of lines, planes, surfaces and changing of coordinates.
(2) Have a deep understanding of Euclidean spaces and linear systems, matrices, multiplication of matrices, using row operations to solve linear systems.
(3) Understand the theory of vectors spaces, bases and dimension, sums, directs sums and products.
(4) Understand Linear transformations and the correspondence between linear transformations and matrices, eigenvalues and eigenvectors, diagonalizing matrices.
(5) Understand inner spaces, orthogonal transformations and orthogonal matrices, Sylvestre's theorem, the dual space, symmetric matrices, singular values and singular value decomposition.

Course policies. The course will be conducted in accordance to the Oakland University regulations and policies. Details can be found here: https://oakland.edu/provost/policies-and-procedures/

Good study habits.

- Take careful notes, make sure to go over them when you get home
- Solve all the problems at the end of each section. Even when you are not able to solve a problem you learn a lot from them if you attempt to do so.
- Create study groups and participate actively on them
- Come to my office hours and ask for help for things that you don't understand. Make sure you come prepared with well though questions.

Grading: The following chart will be used to determine your grade:

Homework:	20%
Midterm I:	20%
Midterm II:	20%
Final:	40%

Grades will be determined with the following scale:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
94-100	90-93	87-89	84-86	80-83	77-79	73-76	70-72	67-69	63-66	60-62	0-59

Monday	Wednesday	Friday
Sep 1st	3rd **1** Section: 1.4	5th **2** Section: 2.1
8th **3** Section: 2.2	10th **4** Section: 2.3	12th **5** Section: 2.4
15th **6** Section: 3.1	17th **7** Section: 3.2	19th **8** Section: 3.3
22nd **9** Section: 3.4	24th **10** Section: 3.5-3.6	26th **11** Section: 4.1-4.2
29th **12** Section: 4.3	Oct 1st **13** Section: 4.4	3rd **14** Review
6th **15** **Midterm I:**	8th **16** Section 5.1	10th **17** Section 5.2
13th **18** Section 5.3	15th **19** Section 5.4	Fall Break 17th
20th **20** Section 6.1	22nd **21** Section 6.2	24th **22** Section 6.3
27th **23** Section 6.4	29th **24** Section 6.5-6.6	31st **25** Review
Nov 3rd **26** **Midterm II:**	5th **27** Section 7.1	7th **28** Section 7.2
10th **29** Section 7.3	12th **30** Section 7.4	14th **31** Section 7.5
17th **32** Section 7.6	19th **33** Section 7.7	21st **34** Section 11.1
24th **35** Section 11.2	26th **36** Section 11.3	Thanksgiving 28th
Dec 1st **37** Section 11.4	3rd **38** Review	5th **39** Review
Final Exam: 8:00-11:00 AM 8th	10th	12th