

# Math 115A: General Course Outline

## Catalog Description

**115A. Linear Algebra. (5)** Lecture, three hours; discussion, two hours. Prerequisite: course 33A. Techniques of proof, abstract vector spaces, linear transformations, and matrices; determinants; inner product spaces; eigenvector theory. P/NP or letter grading.

## Textbook

S. Friedberg, et al, *Linear Algebra*, 4th Ed., Prentice Hall.

## Schedule of Lectures

Lecture	Section	Topics
1	1.2	Vector Spaces over a Field
2	1.3	Subspaces
3	1.4, 1.5	Linear Combinations and Systems of Linear Equations; Linear Dependence and Linear Independence
4	1.5, 1.6	Linear Dependence and Linear Independence; Bases and Dimensions
5	1.6	Bases and Dimensions
6	1.6	Bases and Dimensions
7	2.1	Linear Transformations, Null Spaces, and Ranges
8	2.1	Linear Transformations, Null Spaces, and Ranges
9	2.1, 2.2	Linear Transformations, Null Spaces, and Ranges; The Matrix Representation of a Linear Transformation
10	.	Midterm #1
11	2.2	The Matrix Representation of a Linear Transformation
12	2.3	Composition of Linear Transformations and Matrix Multiplication
13	2.4	Invertibility and Isomorphisms
14	2.4, 2.5	Invertibility and Isomorphisms; The Change of Coordinate Matrix
15	2.5	The Change of Coordinate Matrix
16	4.4	Summary - Important Facts about Determinants
17	5.1	Eigenvalues and Eigenvectors
18	5.1	Eigenvalues and Eigenvectors
19	5.2	Diagonalizability
20	5.2	Diagonalizability
21	5.2	Diagonalizability
22	.	Midterm #2
23	6.1	Inner Products and Norms
24	6.1, 6.2	Inner Products and Norms; The Gram-Schmidt Orthogonalization Process and Orthogonal Complements
25	6.2	The Gram-Schmidt Orthogonalization Process and Orthogonal Complements
26	6.3	The Adjoint of a Linear Operator
27	6.4	Normal and Self-Adjoint Operators
28	6.4	Normal and Self-Adjoint Operators
29	.	Catch-up, Review

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