



Catalog Description:

Matrix algebra, vector spaces and linear maps, bases and dimension, eigenvalues and eigenvectors, applications.

Prerequisite:

C- or better in 2153, 2162.xx, 1172, 2182H, or 4182H; or credit for 254, 263.xx, 263.01H or 264H.

Exclusions:

Restricted to graduate students in engineering. No open to students with credit for 2568 (568), 5101 (601), 5520H (520H) or 572.

Text:

Introduction to Linear Algebra, 5th edition, by L.W. Johnson, R.D. Riess, and J.T. Arnold, published by Pearson, ISBN: 9780321628217.

Topics List:

Part I

- 1.1 Introduction to Matrices and Systems of linear equations
- 1.2 Echelon Form and Gaussian-Jordan Elimination
- 1.3 Consistent Systems of linear Equations
- 1.5 Matrix Operations
- 1.6 Algebraic Properties of Matrix operations
- 1.7 Linear Independence and Nonsingular Matrices
- 1.9 Matrix Inverses and Their Properties

Midterm 1

Part II

- 2.1 Vectors in The Plane (Review only because it was done in 1152)
- 2.2 Vectors in Space (Review only because it was done in 1152)
- 2.3 The Dot Product and The Cross
- 3.1 Introduction
- 3.2 Vector Space Properties of \mathbb{R}^n
- 3.3 Examples of Subspaces
- 3.4 Bases for Subspaces
- 3.5 Dimension
- 5.2 Vector Spaces
- 5.3 Subspaces
- 5.4 Linear Independence, Bases, and Coordinates



- 3.6 Orthogonal Bases for Subspaces
- 3.7 Linear Transformation from \mathbb{R}^n to \mathbb{R}^m

Midterm 2

Part III

- 4.1 The Eigenvalue Problem for 2×2 Matrices
- 4.2 Determinants and the Eigenvalue Problem
- 4.4 Eigenvalues and Characteristic Polynomial
- 4.5 Eigenvectors and Eigenspaces
- 4.6 Complex Eigenvalues and Eigenvectors
- 4.7 Similarity Transformations and Diagonalization

Final