

640:250-C2 Introduction to Linear Algebra (MATLAB Section)

Text: Spence, Insel & Friedberg *Elementary Linear Algebra: A Matrix Approach*
 ISBN # 0-13-716722-9, Prentice-Hall, Upper Saddle River, NJ 07458

Syllabus

Date	Lecture	Reading	Topics
9/05	1	1.1, 1.2	Matrices and Vectors
9/09	2	1.3	Systems of Linear Equations
9/12	3	1.4	Gaussian Elimination
9/16	4	1.6	Span of a Set of Vectors
MATLAB Lab #1 – Matrix and Vector Computations in MATLAB (due 9/19)			
9/19	5	1.7	Linear Dependence and Linear Independence
9/23	6	1.7, 2.1	Homogeneous Systems, Matrix Multiplication
9/26	7	2.1	Matrix Algebra
9/30	8	2.3	Invertibility and Elementary Matrices
MATLAB Lab #2 – Linear Equations and Matrix Algebra (due 10/03)			
10/03	9	2.4	Inverse of a Matrix
10/07	10	2.5	LU Decomposition of a Matrix
10/10	11	Midterm Exam #1	
10/14	12	3.1	Determinants; Cofactor Expansions
10/17	13	3.2	Properties of Determinants
MATLAB Lab #3 – LU Decomposition and Determinants (due 10/21)			
10/21	14	4.1	Subspaces
10/24	15	4.2	Basis and Dimension
10/28	16	4.3	Column Space and Null Space of a Matrix
10/31	17	5.1	Eigenvalues and Eigenvectors
MATLAB Lab #4 – Vector Spaces and General Solution to $Ax = b$ (due 11/04)			
11/04	18	5.2	Characteristic Polynomial
11/07	19	5.3	Diagonalization of a Matrix
11/11	20	5.5	Applications of Eigenvalues (Markov Chains)
11/14	21	Midterm Exam # 2	
11/18	22	6.1	Geometry of Vectors; Projection onto a Line
MATLAB Lab #5 – Eigenvalues and Eigenvectors (due 11/21)			
11/21	23	6.2	Orthogonal Sets of Vectors; Gram-Schmidt Process
11/25	24	6.2	Orthogonal Projection; Orthogonal Complements
11/26	25	6.3	Least Squares; Normal Equations
12/02	26	6.4, 6.5	Orthogonal Matrices; Diagonalization of Symmetric Matrices
MATLAB Lab #6 – Orthonormal Bases and Least Squares Approximations (due 12/05)			
12/05	27	6.5	Spectral Decomposition for Symmetric Matrices Diagonalization of Quadratic Forms
12/09	28	Catch up and review	
12/23		Final Exam 8:00-11:00 AM	