revised 8/18/10

640:250 Introduction to Linear Algebra

Text: Spence, Insel & Friedberg *Elementary Linear Algebra: A Matrix Approach, 2nd Edition*
ISBN # 978-0-13-187141-0, Prentice-Hall, Upper Saddle River, NJ 07458

Syllabus

Lecture	Reading	Topics
1	1.1, 1.2	Matrices, Vectors, and Linear Combinations
2	1.3	Systems of Linear Equations
3	1.4	Gaussian Elimination
4	1.6	Span of a Set of Vectors
5	1.7	Linear Dependence and Linear Independence
6	1.7, 2.1	Homogeneous Systems, Matrix Multiplication
7	2.1	Matrix Algebra
8	2.3	Invertibility and Elementary Matrices
	App. E	Uniqueness of Reduced Row Echelon Form
9	2.4	Inverse of a Matrix
	2.5	Partitioned Matrices and Block Multiplication
10	2.6	LU Decomposition of a Matrix
11	**Midterm Exam #1**	
12	3.1	Determinants; Cofactor Expansions
13	3.2	Properties of Determinants
14	4.1	Subspaces
15	4.2	Basis and Dimension
16	4.3	Column Space and Null Space of a Matrix
17	5.1	Eigenvalues and Eigenvectors
18	5.2	Characteristic Polynomial
19	5.3	Diagonalization of a Matrix
20	5.5	Examples of Diagonalization
21	**Midterm Exam # 2**	
22	6.1	Geometry of Vectors; Projection onto a Line
23	6.2	Orthogonal Sets of Vectors;
		Gram-Schmidt Process; QR factorization
24	6.3	Orthogonal Projection; Orthogonal Complements
25	6.4	Least Squares; Normal Equations
26	6.5, 6.6	Orthogonal Matrices; Diagonalization of Symmetric Matrices
27	6.6	Diagonalization of Quadratic Forms
		Spectral Decomposition for Symmetric Matrices
28		Catch up and review
	Final Exam	(Class Hour Schedule)