

## Math 244-Syllabus

Text book: Elementary Linear Algebra with Supplemental Applications, 10<sup>th</sup> Edition  
By Howard Anton and Chris Rorres

### Chapter 1

1.1 Introduction to Systems of Linear Equations

1.2 Gaussian Elimination

1.3 Matrices and Matrix Operations

1.4 Inverses and Algebraic Properties of Matrices (Proofs of Theorems 1.4.4, 1.4.6, and 1.4.9 are included)

1.5 Elementary Matrices and a Method for Finding  $A^{-1}$

1.6 More on Linear Systems and Invertible Matrices

1.7 Diagonal, Triangular and Symmetric Matrices

### Chapter 2

2.1 Determinants by Cofactor Expansion

2.2 Evaluating Determinants by Row Reduction

2.3 Properties of the Determinants and Cramer's Rule

### Chapter 3

3.1 Vectors in 2-Space, 3-Space and n-Space (From Definition1, Page 124).  
Example 6 on page 134 is NOT included.

3.2 Norm, Dot Product and Distance in  $R^n$  (The proof of Theorem 3.2.6 and Theorem 3.2.7 is included).

3.3 Orthogonality (Definition1, Example1 (a), Theorem 3.3.3, Example 6)

### Chapter 4

4.1 Real Vector Spaces (Exercise 11 is solved in the lecture)

4.2 Subspaces (All except Example 12, the proof of Theorem 4.2.4 is included)

4.3 Linear Independence (Proof of Theorem 4.3.3 is included)

4.4 Coordinates and Basis (From Definition 1)

4.5 Dimension (Exercise 7 (d) is solved in the lecture)

4.7 Row Space, Column Space and Null space

4.8 Rank, Nullity and the Fundamental Matrix Spaces (The proof of theorem 4.8.7 is included). (The concept of orthogonal complement is NOT included).

4.9 Matrix Transformations from  $R^n$  to  $R^m$  (Expansion and Compressions, Shears and Orthogonal projections on lines through the origin are NOT included)

4.10 Properties of Matrix Transformations

## Chapter 5

5.1 Eigenvalues and Eigenvectors