Math 240-Syllabus By Dr. Huda Alsaud

Textbook: Elementary Linear Algebra with Supplemental Applications, 11th Edition By Howard Anton and Chris Rorres

Chapter 1

1.1 Introduction to Systems of Linear Equations

1.2 Gaussian Elimination. (Roundoff Error and Instability Page 22 is NOT included).

1.3 Matrices and Matrix Operations (Column-Row Expansion Page 33, Example 10 are not included)

1.4 Inverses and Algebraic Properties of Matrices (Proofs: Theorem 1.4.4, Theorem 1.4.6, Theorem 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 (Proofs: Theorem 1.7.4, Theorem 1.7.5 are Included)

1.8 Matrix Transformations

Chapter 2

2.1 Determinants by Cofactor Expansion

2.2 Evaluating Determinants by Row Reduction (Proofs: Theorem 2.2.1 is Included)

2.3 Properties of the Determinants and Cramer's Rule (Proofs: Theorem 2.3.5 is Included)

Chapter 4

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

4.2 Subspaces (Example 2, Example 3, Example 12, The Linear Transformation Viewpoint Page 200 are NOT included) (Proofs: Theorem 4.2.2, Theorem 4.2.4 are Included)

4.3 Linear Independence

4.4 Coordinates and Basis (Pages 212 and 213 are NOT included) (Proofs: Theorem 4.4.1 is Included)

4.5 Dimension (Exercise 7 (d) will be solved in the lecture)

4.7 Row Space, Column Space and Null space

4.8 Rank, Nullity and the Fundamental Matrix Spaces. (A Geometric Link Between the Fundamental Spaces Page 252-253, Application of Rank Page 254, Overdetermined and Underdetermined Systems Page 252-256 are NOT included). (Proofs: Theorem 4.8.5 is Included)

Chapter 5

5.1 Eigenvalues and Eigenvectors (Eigenvalues of General Linear Transformations Page 299 is NOT included)

5.2 Diagonalization

Chapter 6

6.1 Inner product

(An Application of Weighted Inner Product on Page 347, Example 3, Example 8, Example 9, Example 10 and Example 11 are NOT included)

6.2 Angle of Orthogonality in Inner Product Spaces

(Orthogonal Complements Page 359-360 , Example 6 are NOT included)

6.3 Gram-Schmidt Process, QR-Decomposition

(Orthogonal Projections Page 368-369, A Geometric Interpretation of Orthogonal Projections Page 369, QR-Decomposition Page 374-375 are NOT included).

Chapter 8

8.1 General Linear Transformations (Examples 9, 17, 18 and 19 are NOT included)

8.4 Matrices for General Linear Transformations (Matrices of Compositions and Inverse Transformations Page 477 and Example 6 are NOT included).