King Saud University / Department of Mathematics
Semester 451 / MATH-244 (Linear Algebra)

Course contents:

Chapter 1: Matrices and algebra of matrices; elementary row and column operations; inverse of a matrix; special matrices.

Chapter 2: Definition of determinant of a square matrix; evaluation of a determinant; properties of determinants; adjoint of a matrix and its properties.

Chapter 3: Systems of linear equations and their kinds; Gauss and Gauss – Jordan elimination methods; Solving linear systems by inverse of a matrix; homogeneous systems of linear equations; Cramer's Rule.

Chapter 4: Definition of a vector space and examples; subspaces; linear combinations and linear span of a set of vectors; linear dependence and linear independence of a set of vectors; bases and dimension of a vector space; coordinates of a vector with respect to a basis; change of bases and transition matrix; rank and nullity of a matrix.

Chapter 5: Definitions of inner product and inner product space with examples; orthogonal and orthonormal sets of vectors; orthonormal basis; Gram-Schmidt orthonormalization process.

Chapter 6: Definition of a linear transformation and examples**; b**asic properties of linear transformations; kernel and image spaces of a linear transformation; matrix of linear transformation.

Chapter 7: Eigenvalues and eigenvectors of a square matrix; diagonalization of a matrix.

Recommended book: *Elementary Linear Algebra* (Applications Version) by Howard Anton and Chris Rorres, 11th Edition, Wiley, USA, 2014.

Recommended Exercises from the above book:

Exercise Set 1.1:	1-23 (odd)
Exercise Set 1.2:	1-32 (odd)
Exercise Set 1.3:	1-6 (all) and 9-27 (odd)
Exercise Set 1.4:	1-33 (odd)
Exercise Set 1.5:	2-20 (even)
Exercise Set 1.6:	9-20 (all)
Exercise Set 1.7:	1-25 (odd)
Exercise Set 2.1:	1-31 (odd)
Exercise Set 2.2:	2-30 (even)
Exercise Set 2.3:	2-32 (even)
Exercise Set 4.1:	1-15 (odd)
Exercise Set 4.2:	1-9 (all) and 10-22 (even)
Exercise Set 4.3:	1-12 (all)
Exercise Set 4.4:	1-22 (all)
Exercise Set 4.5:	1-20 (all)
Exercise Set 4.6:	1-10 (all)
Exercise Set 4.7:	1-21 (odd)
Exercise Set 4.8:	1-21 (odd)
Exercise Set 4.10:	5-10 (all) and 11-19 (odd)
Exercise Set 5.1:	1-14 (all)
Exercise Set 5.2:	2-20 (all)
Exercise Set 6.1:	1,2, 9-12, 17,19,21, 27-29, 33-37
Exercise Set 6.2:	1-11 (odd), 22,23,31,41,44,48
Exercise Set 6.3:	2-5,27,29,32,37,43

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