King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
SYLLABUS
Semester II, 2015-2016 (**152**)
(Prof. Jawad Abuhlail)

Course #:	Math 280	
Title:	Introduction to Linear Algebra	
Instructor	Jawad Abuihlail	abuhlail@kfupm.edu.sa
Office Hours	UTR: 9:00 – 10:00	Building: 5; Room: 507
Textbook:	Steve Leon, *Linear Algebra with Applications*, 8th Edition (Pearson; New International Edition), 2014.	
Description:	MATRICES AND SYSTEMS OF LINEAR EQUATIONS. VECTOR SPACES AND SUBSPACES. LINEAR INDEPENDENCE. BASIS AND DIMENSION. INNER PRODUCT SPACES. THE GRAM-SCHMIDT PROCESS. LINEAR TRANSFORMATIONS. DETERMINANTS. DIAGONALIZATION. REAL QUADRATIC FORMS.	
Learning Outcomes:	Upon successful completion of this course, a student should be able to: • use elementary row operations to solve systems of linear equations and decide whether a square matrix is singular or nonsingular; • express a nonsingular matrix as a product of elementary matrices; • evaluate the determinant of a matrix using cofactor expansion or elementary row (column) operations; • find the inverse of a nonsingular matrix using its adjoint and solve some linear systems by Cramer's method; • construct a basis for a given vector space and evaluate its dimension; • represent a linear transformation by a matrix; • construct an orthonormal basis using the Gram-Schmidt orthogonalization process; • determine the eigenvalues and the eigenspaces of a square matrix; • decide whether a given square matrix is diagonalizable or not; • diagonalize orthogonally a real symmetric matrix;	

Week	**Date(s)**	**Topics**	
1	Jan. 17 - 21	1.1 Systems of Linear Equations	1.2 Row Echelon Form
2	Jan. 24 - 28	1.3 Matrix Arithmetic	1.4 Matrix Algebra
3	Jan. 31- Feb. 4	1.5 Elementary Matrices	2.1 The Determinant of a Matrix
4	Feb. 7 – 11	2.2 Properties of Determinants	2.3 Additional Topics and Applications
5	Feb. 14 – 18	3.1 Vector Space: Definition and Examples	3.2 Subspaces
First Major Exam, Tuesday 16.2.2016; 7:00 – 9:00 PM (Building 4, Room 151)			
6	Feb. 21- 25	3.3 Linear Independence	3.4 Basis and Dimension
7	Feb. 28- March 3	3.5 Change of Basis	3.6 Row Space and Column Space
8	March 6 - 10	4.1 Linear Transformations	4.2 Matrix Representations of Linear Transformations
March 13-17, 2016 Midterm Vacation			
9	March 20 – 24	4.3 Similarity	5.1 The Scalar Product in R^n
10	March 27 – 31	5.2 Orthogonal Subspaces	
Second Major Exam, Thursday 31.3.2016; 7:00 – 9:00 PM (Building 4, Room 151)			
11	April 3 – 7	5.4 Inner Product Spaces	5.5 Orthonormal Sets
12	April 10 – 14	5.6 The Gram-Schmidt Orthogonalization Process	5.7 Orhogonal Polynomials
13	April 17 – 21	6.1 Eigenvalues and Eigenvectors	
14	April 24 – 28	6.3 Diagonalization	
15	May 1 – May 5	6.6. Quadratic Forms	
Final Exam (Comprehensive): Saturday 21.5.2016, 7:00 – 10:00 PM			