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

Course #:	Math 550
Title:	Linear Algebra
Prerequisites	Math 280 (Introduction to Linear Algebra)
Textbook:	Linear Algebra: by K. Hoffman & R. Kunze, 2nd edition, Prentice-Hall (1971).
Description:	Basic properties of vector spaces and linear transformations, algebra of polynomials, characteristic values and diagonalizable operators, invariant subspaces and triangulable operators. The primary decomposition theorem, cyclic decompositions and the generalized Cayley-Hamilton theorem. Rational and Jordan forms, inner product spaces, The spectral theorem, bilinear forms, symmetric and skew symmetric bilinear forms.

Week	Date(s)	Lecture	Section(s)	Topics
1	Jan. 17 –19	Lecture 1	1.1, 2.1, 2.2 (review)	Fields, Vector Spaces, Subspaces
		Lecture 2		
2	Jan. 24 – Jan. 26	Lecture 3	2.3	Bases and Dimension
		Lecture 4	2.4	Coordinates
3	Jan. 31 – Feb. 2	Lecture 5	3.1	Linear Transformations
		Lecture 6	3.2, 3.3	The Algebra of Linear Transformations, Isomorphism
4	Feb. 7 – 9	Lecture 7	3.4	Representations of Transformations by Matrices
		Lecture 8	3.5	Linear Functionals
5	Feb. 14 – 16	Lecture 9	3.6	The Double Dual
		Lecture 10	3.7	The Transpose of a Linear Transformation
First Major Exam, Tuesday 16.2.2016; 7:00 – 9:00 PM (Building :4 Room:151)				
6	Feb. 21 – 23	Lecture 11	6.1, 6.2	Introduction, Characteristic Values
		Lecture 12	6.3	Annihilating Polynomials
	Feb. 28 – Mar. 1	Lecture 13	6.4	Invariant Subspaces
7		Lecture 14	6.5	Simultaneous Triangulation; Simultaneous Diagonalization
8	Mar. 6 – 8	Lecture 15	6.6	Direct-Sum Decompositions
		Lecture 16	6.7	Invariant Direct Sums
March 13-17, 2016 Midterm Vacation				
9	Mar. 20 – 22	Lecture 17	6.8	The Primary Decomposition Theorem
		Lecture 18	7.1	Cyclic Subspaces and Annihilators
10	Mar. 27 – 29	Lecture 19	7.2	Cyclic Decompositions and the Rational Form
		Lecture 20	7.3	The Jordan Form
Second Major: Tuesday 31.3.2016; 7:00 – 9:00 PM (Building :4 Room:151)				
11	Apr. 3 – 5	Lecture 21	8.1	Inner Products
		Lecture 22	8.2	Inner Product Spaces
12	Apr. 10 – 12	Lecture 23	8.3	Linear Functionals and Adjoints
		Lecture 24	8.4	Unitary Operators
13	Apr. 17 – Apr. 19	Lecture 25	8.5	Normal Operators
		Lecture 26	9.5 (partly)	Spectral Theory
13	Apr. 24 – Apr. 26	Lecture 27	10.1	Bilinear Forms
		Lecture 28	10.2	Symmetric Bilinear Forms
14	May 1 – May 3	Lecture 29	10.3	Skew-Symmetric Bilinear Forms
		Lecture 30		Revision
Final Exam: Sunday 15.5.2016, 7:00 – 10:00 PM				

Grading Policy:

First Major	**25%**	Assignments	**10%**
Second Major	**25%**	Final (Comprehensive)	**40%**