

**King Fahd University of Petroleum and Minerals**  
**Department of Mathematics & Statistics**

**Syllabus Math 280**

Semester II, 2013 (132)

Instructor: Dr. Othman Echi

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<b>Course:</b>	Math 280
<b>Title:</b>	Introduction to linear algebra
<b>Textbook:</b>	Linear algebra with applications, Steven J. Leon, Pearson (2014).
<b>Objectives:</b>	This course introduces the basic concepts and techniques of elementary linear algebra to students.
<b>Office Hours</b>	<b>Sunday:</b> 10:00-11:00, 12:15-13:00; <b>Tuesday:</b> 10:00-11:00, 12:15-13:00; <b>Thursday:</b> 10:00-11:00, 12:15-13:00

Lectures	Section	Topic	Homework
1-2-3	1.1	Systems of linear equations	1;3; 6;7
	1.2	Row echelon form	1;2; 3(a,c,e);5(a,d,f,i);6(b,d)
4-5-6	1.3	Matrix arithmetic	2(a,e);9;10(a,b);11;13
	1.4	Matrix algebra	1;2;3; 5;12;14;19;22;24;25
7-8-9	1.5	Elementary matrices	1;3;4;7;8;11,12(a,d)
	1.6	Partitioned Matrices	1;5;6
10-11-12	2.1	The determinant of a matrix	3(a;c;d;h),5,9,11
	2.2	Properties of determinants	2;4;5;6;7;9;12;13
	2.3	Additional topics and applications	1(a,c,d); 2(c,d,e);4;15
13-14-15	3.1	Vector space: Definition and examples	3;6;7;8;10;12
	3.2	Subspaces	1(a,b,c,d);2(b,c,d);4(b);10(b) 11(b,c,d);12(a,b,c);13;14;16
16-17-18	3.3	Linear independence	1(a,c,d,e);2(a,b,c);4(b,c);5;8(a,b,c); 10;12;16
	3.4	Basis and dimension	3;5;7;10;12;14
19-20-21	3.5	Change of basis	1(a,b);6;8;9;10
	3.6	Row space and column space	1(a,b);2(a,b,c);4(a,b,c,d);7;9,12
22-23-24	4.1	Linear transformations: definition and examples	1(b,c);3;6(a,b,c);8(a,b);10;12;13;16
	4.2	Matrix representations of linear transformations	2(a,b),4(b,c);7;8;12;16
25-26-27	4.3	Similarity	2;3;4;6;8;14
	5.1	Orthogonality: The scalar product in $\mathbb{R}^n$	1(a,c,d);3(a,b,c);6;8(a,b);11;16;18
28-29-30	5.2	Orthogonal subspaces	1(a,c);4;7;8;9;12;13
	5.4	Inner product spaces	2;4;7(a,b);10;12;24
31-32-33	5.5	Orthonormal sets	1(c,d);2;4;8;10;14;20;22 30;32;34
34-35-36	5.6	The Gram-Schmidt orthogonalization process	1;4;5;6;8;12;16
	5.7	Orthogonal polynomials	1;2;3
37-38-39	6.1	Eigenvalues and eigenvectors	1(e,f,g,h);4;5;8;13
	6.2	System of linear differential equations	1;2
40-41-42	6.3	Diagonalization	1(a,b,c,f);2;7;8(a,b,g);9
43-44-45	6.6	Quadratic forms	1(a,b);3(a,b,c);6(a,b,d);7(a,b,c);8;10

**Exams and Distribution of Marks:**

- **Five Tests (5x10%)**
- **Final Exam (35%) (Comprehensive)**
- **Homework + Attendance (15%)**