

King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math 280 – Syllabus
2008-2009 (081)
Coordinator: Dr. Mihai Halic

Title: Introduction to Linear Algebra

Credit: 3 – 0 – 3

Textbook: Bernard Kolman, *Elementary Linear Algebra* (6th ed.), 1996.

Objectives: To introduce the basic ideas of linear algebra, and matrix computations, and to teach some techniques to solve linear equations. Students at the sophomore level have a good opportunity to learn how to handle abstract concepts.

Grading policy:

Exam1	: 22%
Exam2	: 22%
Class-Work	: 20%
Final Exam	: 36%

Attendance: A **DN grade** will be given to all students with 12 or more **unexcused absences**. Students coming **more than 15 min. after the beginning** of the course will receive an L=late mark. **Two L marks = One absence.**

Missing an Exam: There will be **no makeup quiz/exam** under any circumstance. If a student misses a quiz/an Exam for a legitimate reason (medical **emergency**, **major** family problems), his grade for this quiz/exam will be determined on the basis of his average performance in the quizzes. Further, the student **must provide an official excuse within 7 days** of the missed quiz/exam.

Timetable

Week	Date	Chapter	Topics	Homework
1	11.10 – 15.10	1.1	Systems of Linear Equations	6, 8, 12, 16, 20
		1.2 1.2	Matrices, Matrix Operations	6, 8, 10, 12, 18, 24
2	18.10 – 22.10	1.3	Algebraic properties of Matrix Operations	8, 10, 12, 20, 30, 32
		1.4	Special Types of Matrices and Partitioned Matrices	6, 10, 14, 18, 34
		1.5	Echelon Form of a Matrix I	-----
3	25.10 – 29.10	1.5	Echelon Form of a Matrix II	2, 4, 10, 16, 28
		1.6	Elementary Matrices; Finding A^{-1}	4, 10, 12, 14, 18, 28
		1.7	Equivalent Matrices	2(a), 4,10(a)
4	01.11 – 12.11	1.8	LU-Factorization	4, 10 Supplementary exercises: 4(a), 8, 14, 19, 22, 24
		2.1	Vectors in the plane and in 3-space	4, 8, 14, 20
		2.2	Vector Spaces	2, 6, 10, 12
5	08.11 – 19.11	2.3	Subspaces	2, 4, 10, 14, 20, 22, 24, 30
		2.4	Linear Independence	6, 10, 14, 22, 28
6	15.11 – 26.11	2.5	Basis and Dimension	2, 4, 6, 10, 14, 24, 26, 32
		2.6	Coordinates and Isomorphisms	2, 4, 8, 16, 22, 30, 38
7	22.11 – 02.12	2.7	Homogeneous Systems	2, 4, 6, 12, 14, 16
		2.8	Rank of a Matrix	2, 4, 12, 14, 18, 24, 32, 34
01.12 Midterm Exam (22%)				
Vacation				
8	14.12 – 17.12	3.1	Standard Inner Product on \mathbb{R}^2 and \mathbb{R}^3	3, 4, 10, 16, 20, 28, 34
		3.2	Cross Product in \mathbb{R}^3	2, 6, 10, 12, 20
		3.3	Inner Product Spaces I	2, 4
9	21.12 – 25.12	3.3	Inner Product Spaces II	10, 16, 20, 26, 40, 48
		3.4	Gram-Schmidt Process	2, 4, 10, 24
		4.1	Definition and Examples of Linear Transf.	2, 4, 10, 12, 26, 28

10	28.12 – 01.01	4.2	Kernel and Range of a Linear Transf.	2, 4, 6, 10, 22
		4.3	Matrix of a linear Transf.	6, 8, 12, 22
		4.6	Similarity	4, 6, 16, 18, 22
04.01 Midterm Exam (22%)				
11	06.01 – 08.01	{5.1,5.2}	Definition and Propertied of Determinants	2, 12, 14 4, 6, 9, 16, 22, 30
		5.3	Co-factor Expansions	2, 12, 16, 18
12	11.01 – 15.01	5.4	Inverse of Matrix	6, 10, 14
		5.5	Other Applications of Determinants	4, 6, 12, 14
		6.1	Diagonalization I	2, 4, 6, 10, 34, 36
13	18.01 – 22.01	6.1	Diagonalization II	2, 4, 6, 10, 34, 36
		6.2	Diagonalization of Symmetric Matrices	2, 4, 6, 12, 34
		6.3	Real Quadratic Forms	2, 4, 11 -- 16, 22, 28
14	25.01 – 29.01	6.4	Conic Sections	1 – 10
		6.5	Quadric Surface, or review the previous chapters (depending on the level of class).	
Final Exam (36%)				