

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

SYLLABUS

Semester I: 2007-2008 (071)

(Dr. Mohammad Samman)

Course #: MATH 550
Title: Linear Algebra
Textbook: Linear Algebra by K. Hoffman and R. Kunze (2nd Edition)
Objectives: This is a first year graduate level course in linear Algebra
 (to provide an understanding of basic concepts of linear algebra)
Prerequisites: Math 280 & Math 345
Lecturer Info: Office: **5-409** Phone: **2674** E-mail: msamman@kfupm.edu.sa
 Web Site: <http://faculty.kfupm.edu.sa/math/msamman>
 Office hours: 10: 00 – 11: 00 pm SMW (Or by appointment)

Weeks	Sections	Topics
1	1.1, 2.1, 2.2 (Review) + 2.3	Fields, review of vector spaces, subspaces, bases & dimensions
2	2.3, 2.4	Cont', coordinates
3	3.1, 3.2, 3.3	Linear transformations, algebra of linear transformations; isomorphisms
4	3.4, 3.5, 3.6	Representation of linear transformation by matrices; linear functionals; the double dual
5	3.7, 6.1, 6.2	The transpose of a linear transformation; introduction (elementary canonical forms); characteristic values
6	6.3, 6.4, 6.5	Annihilating polynomials; invariant subspaces; simultaneous triangulation; simultaneous diagonalization
7	6.5, 6.6, 6.7	Cont'; direct sum decompositions; invariant direct sums
8	6.7, 6.8,	Cont'; the primary decomposition theorem
9	7.1, 7.2	Cyclic subspaces and annihilators; cyclic decompositions and the rational form
10	7.3, 7.4, 7.5	The Jordan form; computation of invariant factors; semi simple operators
11	8.1, 8.2	Inner products; inner product spaces
12	8.3, 8.4	Linear functionals and adjoints; unitary operators
13	8.5, 9.5	Normal operators; spectral theory
14	10.1, 10.2	Bilinear forms; symmetric bilinear forms
15	10.3	Skew symmetric bilinear forms

Evaluation policy:

Exam I (in-class)	20%
Exam II (take-home)	20%
Homework	14%
Class Presentation	6%
Final Exam	40%

