King Fahd University of Petroleum and Minerals
Department of mathematical Sciences
SYLLABUS
Semester II, 2005-2006 (**052**)
(Dr. A. MIMOUNI.)

Course #: Math 551
Title: Abstract Algebra
Prerequisites Math 345& Math 450
Textbook: Algebra: by Serge LANG, Revised Third edition
Discription: Basic definitions of rings and modules, Homomorphisms, Sums and products, Exactness, Hom and Tensor, Adjoint isomorphism, Free, projective and injective modules. Chain conditions, Primary decomposition, Noetherian rings and Modules, Artinian rings, Structure theorem.

Week	Section	Material	Main
1	II.1	Rings and Homomorphisms	Definitions and examples
	II.2	Commutative rings	2.1-2.2
2	II.3	Polynomial rings	pp.97—103
	II.4	Localization	Examples1-3, Ideals of S-1A
3	III.1	Basis definitions of modules	pp.117--120
	III.2	The group of homomorphisms	2.1—2.2
4	III.3	Direct Products and sums of modules	pp.127--132
	III.4	Free modules and projective modules	4.1-4.3. Equiv.of P1-P4
5	III.7	Modules over principal rings	7.1—7.3
6	III.9	The snake Lemma	9.1
7	XVI.1-2	Tensor Products	2.1—2.4, 2.6—2.7
8	XX.4	Injective modules	Equiv. of I1--I3, 4.1
9	X.1	Noeterian rings and modules: basic criteria	1.1—1.6
10	X.2	Associated primes	2.4--2.11
11	X.3	Primary decomposition	3.3—3.5
	IV.4	Hilbert's basis theorem	4.1
12	X.4	Nakayama's lemme	4.2—5-4.5
13	X.7	Artinian Modules	7.1—7.5
14	XVII.2	Semisimplicity	Equiv.of SS1-SS3
	XVII.4	Semisimple rings	4.1—4.3
15	XVII.Ex	Structure results (Exercises1-6, p.661)	(Exercises1-6, p.661)

Grading Policy:
Exam 1 out of 100
Exam 2 out of 100
Exam 3 out of 100
Final Exam out of 200
Total: out of 500