

MATH 595 - 092

2. TEXTBOOK

M. F. Atiyah & I. G. Macdonald, INTRODUCTION TO COMMUTATIVE ALGEBRA, Addison-Wesley, 1969. Paperback edition, Perseus Publishing, December 1994.

3. SYLLABUS

WEEK	MATERIAL
1	RINGS & IDEALS. Prime and maximal ideals. Nilradical and Jacobson radical. Operations on ideals.
2	Extension and contraction.
3	MODULES. Nakayama's Lemma. Exact sequences.
4	Tensor products of modules. Exactness.
5	RINGS AND MODULES OF FRACTIONS. Local properties. Extension & contraction in rings of fractions
6	INTEGRAL DEPENDENCE AND VALUATIONS. Integral dependence. Going-up and going-down theorems.
7	Valuation rings. Hilbert's Nullstellensatz.
8	CHAIN CONDITIONS.
9	NOETHERIAN RINGS.
10	ARTINIAN RINGS.
11	DISCRETE VALUATION RINGS.
12	DEDEKIND DOMAINS.
13-14	TOPOLOGIES & COMPLETIONS.
14-15	DIMENSION THEORY. (PROJECT)

4. GRADING POLICY

Presentations	200
Take-home Exam 1	100
Take-home Exam 2	100
Project	100