

**King Fahd University of Petroleum and Minerals**  
**Department of Mathematics and Statistics**  
**Term 062**

**MATH 654**  
**ADVANCED TOPICS IN ALGEBRA**

**1. BOOK.**

I. Kaplansky, Commutative Rings, The University of Chicago Press, Chicago, 1974.

**2. DESCRIPTION & SYLLABUS**

Week	Material
1	Prime ideals. Integral elements (I) G-ideals, Hilbert rings, and Nullstellensatz .
2	Localization, Prime ideals in polynomial rings Integral elements (II)
3	Integral elements (II) Zero-divisors
4	Zero-divisors
5	Integral elements (III)
6	Intersections of quasi-local domains
7	Macaulay rings
8	Macaulay rings
9	Macaulay rings
10	The principal ideal theorem
11	Regular rings
12	Regular rings
13	Homological aspects. Change of rings for injective dimension
14	Gorenstein rings
15	Gorenstein rings