MATH 551 Abstract Algebra

DESCRIPTION

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. PREREQUISITE: MATH 323 (MATH 345).

TEXTBOOKS

[**L**] ALGEBRA, by **S. LANG**, Third Edition, Graduate Text in Mathematics, 211, Springer.
[**H**] ALGEBRA, by **T. HUNGERFORD**, Graduate Text in Mathematics, 73, Springer.

SYLLABUS

Week	Section – [L]	Material - [L]
1	II.1	Rings and homomorphisms
	II.2	Commutative rings
2	II.3	Group rings and monoid rings
	II.4	Localization
3	III.1	Basic definitions of modules
	III.2	The group of homomorphisms
4	III.3	Direct products and sums of modules
	III.4	Free modules and projective modules
5	III.7	Modules over principal rings
6	III.7	Modules over principal rings (cont.)
	III.9	The snake lemma
7	XVI.1-2-3	Tensor products and flatness
8	XX.4	Injective modules
9	X.1	Noetherian rings and modules: basic criteria
10	X.2	Associated primes
11	X.3	Primary decomposition
	IV.4	Hilbert's basis theorem
12	X.4	Nakayama's lemma
13	X.7	Indecomposable modules
14-15	XVII.2	Semisimplicity
	XVII.4	Semisimple rings and structure results

GRADING POLICY

	Best of	
THW 1: Sections II.1 – XVI.1-2-3 (25 problems – [**L**] & [**H**])	25	-
Midterm Exam: Sections II.1 – XVI.1-2-3 (Duration = 6 hours)	50	75
THW 2: Sections XX.4 – XVII.2.4 (25 problems – [**L**] & [**H**])	25	-
Final Exam: Sections XX.4 – XVII.2.4 (Duration = 6 hours)	50	75
TOTAL	150	