

tentative Syllabus. Math 504, Fall 2009.

Ch.0(1-3) Preliminaries	0.1 Basics, set theory
	0.2 Integers, Euclidean algorithm
	0.3 Integers modulo n
Ch.1(1-7) Introduction	1.1 Axioms, examples
	1.2 Dihedral groups
	1.3 Symmetric groups
	1.4 Matrix groups
	1.5 Quaternions
	1.6 Homomorphisms, isomorphism
	1.7 Actions
Ch.2(1-5) Subgroups	2.1 Definitions, examples
	2.2 Centralizers, normalizers, stabilizers, kernels
	2.3 Cyclic groups
	2.4 Generated subgroups
	2.5 Subgroup lattices
Ch.3(1-5) Homomorphisms	3.1 Definitions, examples
	3.2 Cosets, Lagrange's theorem
	3.3 Isomorphism theorems
	3.4 Composition series
	3.5 Transpositions, alternating groups
Ch.4(1-6) Actions	4.1 Representation by permutations
	4.2 Left multiplication, Cayley's theorem
	4.3 Conjugation, class equation
	4.4 Automorphisms
	4.5 Sylow theorems
	4.6 Simple alternating groups
Ch.5(1-5) Products	5.1 Direct products
	5.2 Fundamental theorem of Abelian groups
	5.3 Small groups
Ch.6(1-3)	6.3 Free groups
Ch.7(1-6) Rings	7.1 Definitions, examples
	7.2 Polynomial, matrix, group rings
	7.3 Homomorphisms, quotients
	7.4 Ideals
	7.5 Fractions
	7.6 Chinese remainder theorem
Ch.8(1-3) Euclidean domains, PIDs, UFDs	8.1 Euclidean domains
	8.2 PIDs
	8.3 UFDs
Ch.9(1-6) Polynomial Rings	9.1 Defs, properties
	9.2 Polynomials rings over fields
	9.3 Polynomials rings \cap UFDs
	9.4 Irreducibility
	9.5 Polynomials rings over fields (cont.)