

MATH 123 - ALGEBRA II
TENTATIVE SCHEDULE

| Day | Topic |
|------------------------|--|
| W, Jan 29 F, Jan 31 | Introduction. Basic definitions and examples. HW1 out Homomorphisms, ideals, quotients, iso theorems |
| W, Feb 5 F, Feb 7 | Maximal and prime ideals, field of fractions, Chinese remainder. HW1 due. HW2 out Principal ideal domains, Unique factorization |
| W, Feb 12 F, Feb 14 | Factorization in polynomial rings. Gauss' lemma. Irreducibility criteria. HW2 due. HW3 out Modules. \mathbb{Z} -modules and $F[x]$ -modules. Homomorphisms |
| W, Feb 19 F, Feb 21 | Direct sums, free modules. HW3 due. HW4 out Structure of modules over PID. Application to abelian groups |
| W, Feb 26 F, Feb 28 | Application to the Jordan canonical form. HW4 due. HW5 out Fields. Adjoining a root |
| W, Mar 4 F, Mar 6 | Algebraic field extensions. HW5 due. HW6 out Applications to straightedge and compass constructions |
| W, Mar 11 F, Mar 13 | Splitting field and algebraic closure. Fundamental theorem of algebra. HW6 due. HW7 out Midterm (in class) |
| W, Mar 18 F, Mar 20 | No class (Spring break) No class (Spring break) |
| W, Mar 25 F, Mar 27 | Separable and inseparable extensions, finite fields. HW7 due. HW8 out Cyclotomic extensions |
| W, Apr 1 F, Apr 3 | Galois theory: definition of the Galois group. HW8 due. HW9 out Fundamental theorem of Galois theory |
| W, Apr 8 F, Apr 10 | Irreducible polynomials over finite fields. HW9 due. HW10 out Composite and simple extensions |
| W, Apr 15 F, Apr 17 | Cyclotomic extensions revisited. Constructibility of the regular n -gon. HW10 due. HW11 out Galois groups of polynomials |
| W, Apr 22 F, Apr 24 | Insolvability of the quintic. HW11 due. HW12 out Selected topics |
| W, Apr 29 F, Apr 31 | Selected topics. Final out (take home). HW12 due No class. Final due. |