

Abstract Algebra II

Instructor: Michael Hanson

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Text: *Galois Theory* (4th edition) by Ian Stewart
(supplemental/reference text: *Abstract Algebra* by Dummit & Foote)

Course Description. This is a second course in abstract (modern) algebra. We will study the topics below and more if time permits.

- (\approx 3 weeks) Polynomials in several variables, elementary symmetric functions and symmetric polynomials, resultant and discriminant.
- (\approx 4 weeks) Field extensions (algebraic and transcendental), splitting fields, primitive element theorem, finite fields.
- (\approx 4 weeks) Galois groups of a finite extensions, Fundamental theorem of Galois theory, solvable groups and radical extensions, Abel–Galois theorem.
- (\approx 4 weeks) Galois group of the polynomials $t^n - a$, of cyclotomic polynomials, and of polynomials of degrees 2, 3, and 4. The inverse problem: the symmetric group S_p and finite cyclic groups as Galois groups over \mathbb{Q} . The general equation of degree n .

Grading

Homework: 25%

Two Midterms: 50%

Final Exam: 25%