

Mathematics 128B
Spring 2004

Instructor: Professor R. Alperin: Office: Duncan 239; Telephone: 924-5066;
Office hours: 10:30-11:30; 1:30-3:00TR,

Text: *A First Course in Abstract Algebra, J. Fraleigh, 7th Edition, Addison-Wesley*

Course: Abstract Algebra

In this course we will continue the study of abstract algebraic structures initiated in Math 128A with an in depth treatment of rings and fields. The modern theory of rings includes not only the basic homomorphism theorems and theory of ideals but a study of the important classes of Euclidean rings, principal ideal domains and unique factorization domains, including applications to number theory. The theory of fields includes the development of Galois Theory together with important consequences for solving polynomial equations using radicals, the resolution of several famous ruler and compass problems of the ancients (trisection of angles, doubling the cube and squaring the circle), the structure of finite fields and algebraic coding theory.

Prerequisites are Math 42, 128A 129A with grades of C- or better. Final grade based on 350 point total on tests; notebook of homework assignments to be collected during each exam or when announced in class.

Chapter IV: Rings and Fields, §18-§25 8 Lectures

Chapter V: Ideals and Factor Rings, §26- §28, 3 Lectures

MIDTERM 1: March 9, 100 points

Chapter VI: Extension Fields, §29-§33, 5 Lectures

Chapter IX: Factorization, §45-§47, 3 Lectures

MIDTERM 2: April 15, 100 points

Chapter X: Automorphisms and Galois Theory, §48-§56, 9 Lectures

COMPREHENSIVE FINAL, 150 points, May