

Syllabus for SM462, Algebraic Structures

Text: Contemporary Abstract Algebra, 7th edition, by Joseph Gallian

This course is an introduction to the important algebraic structures such as rings, integral domains, fields, vector spaces and their homomorphisms. If time permits we shall also cover extensions of fields, and geometric constructions.

Additionally, if time permits, I will discuss applications to cryptology and perhaps an outline of Galois Theory.

We shall start with Part 3 Rings in the text.

Chapter 12 Introduction to Rings

Chapter 13 Integral Domains

Chapter 14 Ideals and Factor Rings

Chapter 15 Ring Homomorphisms

Chapter 16 Polynomial Rings

Chapter 17 Factorization of Polynomials

Chapter 18 Divisibility in Integral Domains

Chapter 19 Vector Spaces

If time permits, we shall cover

Chapter 20 Extension Fields

Chapter 22 Finite Fields

Chapter 23 Geometric Constructions

Applications to Cryptology (My notes)

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