MAT 604 - Algebraic Structures II

Catalog Description:

(B) Abstract algebra with an emphasis on rings and fields. Topics include integral domains, ideals, polynomial rings, and field extensions. Prerequisite: MAT 501 and an undergraduate course in abstract algebra. (3 cr. hr.)

Course Goals / Objectives:

- A thorough understanding of rings and fields
- Reinforcement of concepts from undergraduate algebra (homomorphisms, substructures, quotient structures)

Required Topics:

- Rings and fields: definition, basic properties
- Integral domains, fields of quotients
- Polynomial rings
- Ideals, prime ideals, maximal ideals
- Homomorphisms, quotient rings
- Field extensions, algebraic and transcendental extensions, degree of a field extension

Optional Topics:

- Geometric constructions
- Finite fields
- Unique factorization domains (UFDs)
- Euclidean domains