

Abstract Algebra II (3)

(Effective Spring 2017)

Prerequisite: Math 310 and Math 314 and Math 471.

Catalog Description: Equivalence relations and partitions. Properties of the integers. Elementary theory of groups and rings. Polynomial rings, integral domains, divisibility, unique factorization domains, fields, vector spaces, and linear transformations. Students are required to submit written work and make an oral presentation.

Learning Outcomes for Major: This course addresses one or more of the student learning outcomes for the major. Upon completion of his/her degree from the University of Tennessee at Martin with a major in mathematics, the graduate will be able to:

- i. apply mathematical concepts and principles to perform numerical and symbolic computations.
- ii. use technology appropriately to investigate and solve mathematical and statistical problems.
- iii. write clear and precise proofs.
- iv. communicate effectively in both written and oral form.
- v. demonstrate the ability to read and learn mathematics and/or statistics independently.

Teaching Objectives: The student will:

1. Understand the relationships among polynomial rings, roots of polynomials, and field extensions.
2. Apply knowledge of vector spaces to field extensions.
3. Investigate various properties of finite fields.
4. State and apply the isomorphism theorems.
5. State and apply Sylows theorems.
6. Apply algebraic results to problems involving number theory and geometric constructions.

Text(s): Contemporary Abstract Algebra, Joseph Gallien, 9th Edition, 2016, Cengage Learning, ISBN-10: 1-305-65796-9.

Outline:	Chapter	Title (Sections)	Days
	11	Finitely Generated Abelian Groups	6
	17-22	Polynomial Rings, Vector Spaces, Extension Fields, and Finite Fields	10
	23	Geometric Constructions	5
	24-25	p-Groups, the Sylow Theorems, and Finite Simple Groups	6
	26-33	Introduction to Galois Theory and other Selected Topics	10
		One period tests	4
		Total days	41

**Disability
Services:**

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