

INSTITUTE OF MATHEMATICS
College of Science
University of the Philippines Diliman

Math 110.3 Course Syllabus

A. Course Catalogue Description

Course Number	Math 110.3
Course Title	Abstract Algebra III
Course Description	Polynomial rings and factorization; field extensions, splitting fields, finite fields, field automorphisms; introduction to Galois theory
Prerequisite	Math 110.1
Course Credit	3 units
Number of Hours	3 hours/week

B. Course Content

- I. Course Introduction and Orientation
- II. Introduction to Rings and Fields
 1. Rings of Polynomials
 2. Factorization of Polynomials over a Field
- III. Factor Rings and Ideals
 1. Homomorphism and Factor Rings
 2. Prime and Maximal Ideals
- IV. Factorization
 1. Unique Factorization Domains
 2. Euclidean Domains and Principal ideal domains
 3. Gaussian Integers and Norms
- V. Extension Fields
 1. Introduction to Extension Fields
 2. Review on Vector Spaces
 3. Algebraic Extensions
 4. Geometric Constructions
 5. Finite Fields
- VI. Automorphisms and Galois Theory
 1. Automorphisms of Fields
 2. The Isomorphism Extension Problem
 3. Splitting Fields
 4. Separable Extensions
 5. Galois Theory
 6. Illustrations of Galois Theory
 7. Cyclotomic Extensions

For a more detailed syllabus, send an email request to ddapr@math.upd.edu.ph.