

INSTITUTE OF MATHEMATICS
College of Science
University of the Philippines Diliman

Math 110.2 Course Syllabus

A. Course Catalogue Description

Course Number	Math 110.2
Course Title	Abstract Algebra II
Course Description	Vector spaces; linear transformations; matrices; diagonalizability; eigenvalues and eigenvectors; inner product spaces; normal matrices
Prerequisite	Math 110.1
Course Credit	3 units
Number of Hours	3 hours/week

B. Course Content

I. Course Introduction and Orientation

II. Vector Spaces

1. Field, vector space over a field, subspace, direct sum
2. Linear combination of vectors, linear independence
3. Spanning sets, basis, dimension

III. Linear Transformations and Matrices

1. Kernel and range of a linear transformation, rank-nullity theorem
2. Matrix, matrix operations, coordinate vector
3. Matrix of a linear transformation
4. Nonsingular matrix, change of basis, similarity, equivalence
5. Elementary operations, solving systems of linear equations

IV. Determinants

1. Determinant of a matrix, cofactor, characteristic polynomial of a matrix
2. Eigenvalues and eigenvectors of a matrix
3. Algebraic and geometric multiplicity of an eigenvalue, diagonalizability

V. Inner Product Spaces

1. Inner product, inner product space, norm
2. Orthonormal set, Gram-Schmidt process
3. Normal, orthogonal and unitary matrices

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