Semester II
Course No :MAT411/ AMAT 411   **Advanced Abstract Algebra –II**   **Credits :6**

Objective: To become familiar with algebraic structures such as rings, fields and to study their properties.

Unit- I
Preliminaries of rings, definition, types, subring, ideal, prime, maximal ideas, nil, nilpotent ideals and their properties. Quotient ring, Homomorphism, isomorphism and related results. UFD, PID, Euclidean domain, polynomial rings and their properties.

Unit – II
Vector spaces, subspaces, generating set, linear dependence and independence, basis and dimension, quotient space, homomorphism, dual space, inner product space and modules. Liner transformation and their properties,

Unit – III
Extension fields, irreducible polynomials, algebraic extension and their properties, splitting field, normal extension, multiple roots, finite fields, separable extension.

Unit – V
Automorphism groups, fixed field, fundamental theorm of Galois theory, polynomials solvable by radicals, ruler and compass constructions.

Outcome: The student will become familiar with various algebraic structures and their properties.

Text Books:

1) Topics in Algebra by I. N. Herstein, Wiley 1999.
2) Basic Abstract Algebra by Bhattacharya, Jain and NagPaul, Cambridge (Indian Edition) 2007.
Chapter 3, 4 from[1], Chapter 15, 16, 17 and Article 5, chapter 18 from [2,]

Reference book: Contemporary Abstract Algebra by J. A. Gallian,Narosa 2010.