FMCC801 ALGEBRA-II(3-1-0)

Module-I (14 hours)

Normal subgroup, Isomorphism theorem, Automorphisms, Permutation group: Cyclic decomposition and Alternating group A_n. Structure theorems for groups: Direct Product, finitely generated abelian group. Structure theorem for groups: Invariants of a finite abelian group, Sylows theorem. Unique factorization domain, Principal ideal domain, Euclidean domains, polynomial rings over UFD.

Module-II(12 hours)

Algebraic extension of fields: Irreducible polynomials and Einstein criterion, Adjunction of roots, Algebraic extension. Algebraically closed fields, Normal separable extensions: splitting fields, normal extensions. Normal separable extension: Multiple roots, Finite fields, Separable extensions.

Module-III (14 hours)

Galois Theory: Automorphism groups and fixed field s, Fundamental theorem of Galois theory. Application of Galois theory to classical problems: Roots of unity and Cyclotomic polynomials, Cyclic extensions, Polynomials solvable by radicals, Symmetric functions, Ruler and compass constructions.

Text Book

P.B. Bhattacharya, S.K Jain and S.R.Nagpaul: Basic Abstact Algebra, Cambridge University Press. Chapter : 5 (Art 2,3), 7(Art 1,2), 8(Art 1-4), 11 (Art 1-4), 15(Art 1-3), 16(Art 1,2), 18(1-5).

Reference Books:

1. **VivekSahai and VikasBist :** Algebra (Narosa publication House).

2. **I.S. Luthar and I.B.S. Passi :** Algebra Vol. 1 Groups (Narosa publication House).

3. **I.N. Herstein :** Topics in Algebra (Wiley Eastern Ltd.).

4. **Surjit Singh and QuaziZameeruddin :**Modern Algebra (Vikas Publishing House).

5. **S.K. Jain & S.R. Nagpal :** Basic Abstract Algebra (Cambridge University Press 1995).

6. **Dummit** : Abstract Algebra , Wiley

7. Modern Algebra by A. R. Vasishtha, Krishna PrakashanMandir, Meerut.