

UNIT IV : Congruences on completely O - Simple s-emigroups. The lattice of congruences on a completely O - simple semigroup. Finite congruence free semigroups.

Textbook : An introduction to semigroup Theory by J. M Howie (1976). Academic Press, New York.

Contents of the syllabus - chapter - I, II & III of the above book.

M310 - GRAPH THEORY

SX-S 310

UNIT I : Properties of Trees, Distance in graphs. Disjoint spanning trees Enumerating of Trees. Spanning trees in graphs. Decomposition and graceful labellings. Minimum spanning tree. Shortest paths. Trees in Computer Science.

UNIT II : Eulerian graphs and digraphs. Eulerian circuits, Directed graphs. Affiliations. Matchings in Bipartite graphs. Maximum matchings. Hall's Matching condition, Min-Max Theorems, Independent sets.

UNIT III : Applications and Algorithms. Maximum Bipartite Matching weighted Bipartite Machine, stable matchings. Faster Bipartite Matching. Tutte's 1factor Theorem, f -factors of graphs, Edmand's Blossom Algorithm. Connectivity.

UNIT IV : Edge connectivity, Blocks, 2 - Connected graphs, Connectivity of Digraphs. k -connected and k -edge connected graphs. Applications of Menger's Theorem. Maximum net work flow, Integral flows, supplies and Demands.

Textbook : Introduction to graph theory by Douglas B. West, Univesity of Illionois - Urban. Prentice Hall of India Pvt. Ltd., New Delhi - 110 001, 1999.

Contents of the syllabus :- Chapters 2, 3, 4 from the above book.

M311 - GALOIS THEORY

SX-S 311

2000-2001

AB

UNIT I : Field Theory : Algebraic extension of fields. Irreducible polynomials and Eisenstein criterion. Adjunction of roots. Algebraic extensions. Algebraically closed fields.

UNIT II : Normal and separable extensions : Splitting fields, normal extensions. Multiple roots, finite fields, Separable extensions.

UNIT III : Galois Theory : Automorphism groups and fixed fields. Fundamental Theorem of Galois Theory. Fundamental Theorem of algebra.

UNIT IV : Applications of Galois Theory to Classical problems :

Roots of unity and cyclotomic polynomials, cyclic extensions, Polynomials solvable by radicals, Symmetric functions, Ruler and compass constructions.

Textbook : Basic Abstract Algebra - By Bhattacharya, S.K. Jain and S.R. Nagpaul. Second Edition. Published by Foundation Book, 2/19 Ansain Road, Daryaganj, New Delhi - 110 002.

Context of the syllabus : - Chapters, 16, 17 and 18 of the above book.