GIET UNIVERSITY GUNUPUR-765022

DEPARTMENT OF BSH

DISCRETE MATHEMATICAL STRUCTURE (CSE & IT)

Pre –Requisite: Fundamental of sets, solution of algebraic equations

Subject Code	Title of the subject	L	T	P	C	
	DISCRETE MATHEMATICAL STRUCTURE	3	1	0	4	

Course Educational Objectives

CEO1	To know logical equivalence and to apply in various proofs.
CEO2	To know about relation and recurrence relation..
CEO3	To study Boolean Algebra and its properties..
CEO4	To know about Graphs and trees.

Course Outcomes: Towards the end of the course students will be able to :

CO1	Understanding the concept of logic, groups, lattice. graphs and trees
CO2	Memorize the logical gates, recurrence formulas and different types of graphs
CO3	Evaluate the arguments ,predicates and quantifiers ,solution of recurrence relations ,methods of solution
CO4	Analyze recurrence relation by generating functions and groups, binary trees
CO5	Categorize different types of graphs, and it's property
CO6	Solve the logical equivalences , Boolean algebra and pre order and post order of arthmic operations

CO-PO & PSO Mapping

COs	PROGRAMME OUTCOMES												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1	2													
CO2	2	3													
CO3	2	3													
CO4	2	3													
CO5	2	3													
CO6	2	3													

SYLLABUS

UNIT I - MATHEMATICAL LOGIC AND SET THEORY (10 Hours)

Propositional logic, Logical Equivalence, Predicate Calculus, and Quantifiers Statement Calculus, Nested Quantifiers, Proof methods and Strategies.

UNIT II- RECURRENCE RELATION (10 Hours)

Recurrence relation, Solution to recurrence relation, Generating functions, Inclusion and exclusion principle, Relation and their properties, Closure of relations, Equivalence relations, Partial order relations, posets

UNIT III- GROUP THEORY (12 Hours)

Semi groups, Monoids, Groups, Subgroups, and Permutation groups, Normal subgroups, Homomorphism, Isomorphism.

UNIT IV- GRAPH THEORY (**10 Hours)**

Basic Definitions – Some Special Graphs – Matrix Representation of Graphs --– Paths and circuits – Eulerian Theorem, Hamiltonian Theorem. Graphs – connected graphs, Graph coloring , Trees - Spanning Trees - Rooted trees – Binary Trees, Minimum Spanning tree -Kruskal's algorithm , Prim's algorithm , Tree Traversal.

UNIT V - BOOLEAN ALGEBRA AND LATTICES (**10 Hours)**

Lattices, Distributive and Complemented Lattices, Sub-lattices, Boolean Lattices and Boolean algebra, Boolean Functions and Boolean Expressions

Reference Books:

1. Kenneth H. Rosen, "Discrete Mathematics and its Applications", Sixth Edition, 2008, Tata McGraw Hill Education, New Delhi
2. J. P. Trembly and Manohar, Discrete Mathematical structures with applications to computer science
3. C. L. Liu and D. Mohaptra, "Elements of Discrete Mathematics", Third Edition, 2008,
4. N. Deo, Graph Theory and Applications to Engineering and Computer Science, Prentice Hall of India
5. Ralph P. Grimaldi," Discrete and Combinatorial Mathematics", Fifth Edition, 2005,Pearon Education, New Delhi.