

COURSE TEACHING STRUCTURE

Discrete Mathematics Teaching Plan

Dept: COMPUTER

Class: SE

Unit number and name	Lect. no	Topic will be covered
Unit-1 Sets And Propositions	1	Introduction to sets, Examples of sets, Representation of sets, Types of sets. Operations on sets with examples. MCQs and solved examples
	2	Representation of set by Venn diagram, Algebra of Set Operations, Venn Diagram for Laws, Principle of Inclusion and Exclusion. MCQs and solved examples
	3	Examples on Principle of Inclusion and Exclusion, Multisets , Operations on multisets MCQs and solved examples
	4	Basic principles of mathematical Induction Examples on mathematical induction
	5	Propositions: Propositions, Logical Connectives, Conditional and Bi-conditional Propositions MCQs and solved examples
	6	Logical Equivalence, Validity of Arguments by using Truth Tables MCQs and solved examples
	7	Predicates and Quantifiers, Normal forms MCQs and solved examples
Unit-2 Combinatorics And Discrete Probability	1	Basic principles of counting Rule of Production Rule of Sum MCQs and solved examples
	2	Permutation without repetition Permutation with repetition Combination Combination with repetition MCQs and solved examples

	3	Discrete Probability :Sample Space, Event Algebra of Events Probability of an Event MCQs and solved examples
	4	Addition theorem on probability: Conditional Probability MCQs and solved examples
	5	Bayes Theorem MCQs and solved examples
	6	Information and Mutual Information, Applications of Combinatorics and Discrete Probability MCQs and solved examples
Unit-3 Graph Theory	1	Graph: Basic Terminologies, Multi-Graphs, Weighted- Graphs, Sub-Graphs, Isomorphic graphs MCQs and solved examples
	2	Operations on Graphs, Paths, Circuits, Hamiltonian and Eulerian graphs. MCQs and solved examples
	3	Travelling Salesman Problem, Factors of Graphs, Planar Graphs, Graph Colouring MCQs and solved examples
	4	Tree: Tree Terminologies, Rooted Trees, Path Length in Rooted Trees, Prefix Codes, MCQs and solved examples
	5	Spanning Trees, Fundamental Cut Sets and Circuits, MCQs and solved examples
	6	Max flow –Min Cut Theorem (Transport Network). Applications of Graph Theory. MCQs and solved examples
Unit-4 Relations And Functions	1	Properties of Binary Relations, Closure of Relations, Warshall's Algorithm MCQs and solved examples
	2	Equivalence Relations, Partitions, Partial Ordering Relations, Lattices, Chains and Anti Chains MCQs and solved examples
	3	Functions, Composition of Functions, Invertible Functions MCQs and solved examples
	4	Pigeonhole Principle, Discrete Numeric Functions. MCQs and solved examples

	5	Recurrence Relation, Linear Recurrence Relations with Constant Coefficients MCQs and solved examples
	6	Linear Recurrence Relations with Constant Coefficients, Total Solutions. Applications of Relations and Functions. MCQs and solved examples
Unit-5 Introduction To Number Theory	1	Properties of Divisibility, Division Algorithm MCQs and solved examples
	2	Modular Arithmetic, Congruence Relation MCQs and solved examples
	3	Greatest Common Divisor (GCD) and its Properties, Euclidean Algorithm MCQs and solved examples
	4	Extended Euclidean Algorithm, Prime Factorization Theorem MCQs and solved examples
	5	Additive and Multiplicative Inverses, Chinese Remainder Theorem MCQs and solved examples
	6	Euler Phi Function, Euler's Theorem, Fermat's Little Theorem MCQs and solved examples
Unit-6 Algebraic Structures	1	Algebraic Structures, Semigroup, Monoid, Group MCQs and solved examples
	2	Abelian Group, Permutation Groups, Cosets, Examples MCQs and solved examples
	3	Subgroup, Normal Subgroup, Quotient Group, Cyclic group, Examples MCQs and solved examples
	4	Ring and their types with examples MCQs and solved examples
	5	Integral Domain, Fields with examples MCQs and solved examples
	6	Codes and Group Codes, and Applications of Algebraic Structures MCQs and solved examples