

Course Curriculum

Course Code: CSE208

Course Level UG

Course Title Discrete Mathematical Structures

Course Description :

Credit Units

L	T	P/S	SW	AS/DS	FW	No. of PSDA	Total Credit Unit
3	0	0	0	0	0	0	3

Course Objectives :

SN	Objectives
1	Provide the fundamentals and the concepts of Discrete Mathematical Structures with Applications to Computer Sciences including Mathematical Logic, Boolean Algebra and its Applications, Graphs and Trees.
2	Help the students to understand the computational and algorithmic aspects of Sets, Relations, Mathematical Logic, Boolean algebra, Graphs, Trees and Algebraic Structure in the field of Computer sciences and its applications.

Pre-Requisites : General

SN. **Course Code** **Course Name**

Course Contents / Syllabus :

SN.	Module	Descriptors / Topics	Weightage
1	Set Theory and Mathematical Logic	Sets and Subsets, Venn Diagrams, Operations on sets, Laws of set theory, power sets and product of sets, principle of inclusion-exclusion. Proposition, Propositional Calculus- Propositional Variables and Compound propositions, Basic Logical Operations: Conjunction, Disjunction, Negation, Conditional, Biconditional. Compound Statements, Equivalence, Duality, Algebra of Statements, Valid and Invalid, Arguments, Tautologies, Contradiction, Contingency	25.00
2	Relations, diagraphs and lattices	Definition and Properties of relation, type of relation, diagraph representation of relation, equivalence and partially ordered relation, transitive closure and Warshall's algorithm, posets and Hasse diagrams, Introduction to Lattice, Types of Lattice, Distributed and Complemented lattice, Lattice as a Boolean Algebra.	20.00
3	Boolean Algebra and Applications	Definition of Boolean Algebra, Laws of Boolean Algebra, Basic Theorems, Boolean Functions – Disjunctive Normal Form, Conjunctive Normal Form, Duality Principle. Boolean Expression – Sum of Products, Product of Sum, Minterm and Maxterm, Applications of Boolean Algebra.	20.00
4	Graphs and Trees	Graph: Finite graph, Infinite graph, connected graph, Disconnected graph, Null graph. Subgraph, Incidence, Adjacency, Degree, Directed Graph, Walk, Path, Circuit, Wheel, Eulerian graph, Hamiltonian graph, Planar graph, Isomorphism of Graph, coloring of Graph. Tree: Properties of Tree, weighted tree, rooted tree, binary tree, Spanning Tree, Incidence Matrix, Adjacency Matrix.	20.00
5	Algebraic Structure	Algebraic structure with one binary operation, semi groups, monoid and groups, isomorphism, homomorphism, cyclic group.	15.00

Course Learning Outcomes :

SN. **Course Learning Outcomes**

1	Understand and Demonstrate basics of mathematical Sets and proposition calculus
2	Demonstrate the knowledge of relations, diagraphs and lattices.
3	Understand the concept Boolean algebra, its properties and circuit design.

4	Apply the knowledge of Graph theory and trees in computer science
5	Demonstrate the knowledge of Algebraic Structures, its properties and various operations.

Pedagogy for Course Delivery :

SN. Pedagogy Methods

1	The class will be taught using remote teaching methodology. Students' learning and assessment will be on the basis of four quadrants and flipped class method. E-content will be also provided to the students for better learning. The course will be taught in theory based mode. The instructor will discuss numerical computation problems to the students for better understanding of the concept.
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Theory /VAC / Architecture Assessment (L,T & Self Work): 100.00 Max : 100

Attendance+CE+EE : 5+35+60

SN.	Type	Component Name	Marks
1	Attendance		5.00
2	End Term Examination (OMR)		60.00
3	Internal	CLASS TEST	15.00
4	Internal	HOME ASSIGNMENT	10.00
5	Internal	CLASS QUIZ	10.00

Lab/ Practical/ Studio/Arch. Studio/ Field Work Assessment : 0.00 Max : 100

N/A

List of Professional skill development activities :

No.of PSDA : 0

SN. PSDA Point

Text & References :

SN.	Type	Title/Name	Description	ISBN/ URL
1	Book	C.L. Liu, Elements of Discrete Mathematics, Tata McGraw Hill, Second Edition		
2	Book	Kenneth H. Rosen, Discrete Mathematics and its Applications, Mc.Graw Hill		
3	Book	J.P.Tremblay & R. Manohar, "Discrete Mathematical Structure with Applications to Computer Science" M		
4	Book	Colmun, Busby and Ross, Discrete Mathematical Structure, PHI, 6th Edition,		