

PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY

(Autonomous)

KANURU, VIJAYAWADA-520007

I B.Tech – II Sem CSE (AI&ML)

DISCRETE MATHEMATICAL STRUCTURES

Course Code	20BS1207	Year	I	Semester	II
Course Category	Basic Science Course	Branch	CSE(AI&ML)	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Basic Mathematics
Continuous Evaluation :	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to

CO1	Understand the fundamental concepts of discrete mathematical structures	L2
CO2	Apply Normal forms/Rules of Inference for solving suitable problems.	L3
CO3	Apply the method of characteristic roots for solving different recurrence relations.	L3
CO4	Analyze various graph techniques to construct a tree.	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2													
CO2	3													
CO3	3													
CO4		2										1		

Unit No.	Syllabus	Mapped CO's
	Contents	
I	<p>Mathematical Logic: Introduction-Statements and Notations-Connectives(Negation,Conjunction,Disjunction)-Statement formulas and Truth Tables, Conditional and Bi-conditional, Well-Formed Formulas, Tautologies, Equivalence of Formulas, Duality Law, Tautological Implication, Functionally Complete Sets of Connectives, Other Connectives.</p> <p>Normal Forms: Disjunctive Normal Forms (DNF), Conjunctive Normal Forms (CNF), Principal of Disjunctive Normal Forms (PDNF), Principal of Conjunctive Normal Forms (PCNF).</p>	CO1, CO2
II	<p>Theory of Inference for Statement Calculus: Validity using Truth Tables-Rules of Inference – Consistency of Premises</p> <p>Predicate calculus: Introduction to Predicates - Statement functions, Variable and Quantifiers- Predicate Formulas-Free and Bound Variables-Universe of Discourse.</p>	CO1,CO2
III	Recurrence Relations -The Method of Characteristic Roots-Solutions in Inhomogeneous Recurrence Relation.	CO1,CO3
IV	Relations and Directed Graphs -Special Properties of Binary Relations-Equivalence Relations- Ordering Relations, Lattices, Operations on Relations- Paths and Closures-Directed Graphs and Adjacency Matrices	CO1,CO4
V	Graphs - Basic Concepts- Isomorphism's and Sub graphs-Trees and Their Properties - Spanning Trees-Planar Graphs-Euler's Formula- Multi-graphs and Euler Circuits-Hamiltonian Graphs- Chromatic Numbers.	CO1,CO4

Learning Resources
Text Books
<ol style="list-style-type: none"> Discrete Mathematical Structures with Applications to Computer Science, J P Trembly and R Manohar, 1988, McGraw-Hill (Unit-I,II) Discrete Mathematics for Computer Scientists & Mathematicians, Joe L. Mott. Abraham Kandel and Theodore P. Baker, Second Edition, 2017, PHI. (Unit-III,IV,V)
References
<ol style="list-style-type: none"> Discrete Mathematics and its Applications, Kenneth H. Rosen, Seventh Edition, 2017, McGraw-Hill.
e-Resources & other digital material
<ol style="list-style-type: none"> https://www.geeksforgeeks.org/engineering-mathematics-tutorials/ https://www.tutorialspoint.com/discrete_mathematics/index.htm http://www.alas.matf.bg.ac.rs/~mi10164/Materijali/DS.pdf https://nptel.ac.in/courses/111107058/