PVP SIDDHARTHA INSTITUTE OF TEHNOLOGY, KANURU, VIJAYAWADA
(AUTONOMOUS)
INFORMATION TECHNOLOGY
Engineering Mathematics III
(Discrete Mathematical Structures)
(Common to CSE & IT)

Course Code	20BS1303	**Year**	II	**Semester**	I
Course Category	BS	**Branch**	IT	**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:Substantial, 2: Moderate, 1:Slight)

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

Syllabus

Unit No.	Contents	Mapped CO
I	**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. **Normal Forms:** Disjunctive Normal Forms (DNF), Conjunctive Normal Forms (CNF), Principal of Disjunctive Normal Forms (PDNF), Principal of ConjunctiveNormal Forms (PCNF).	**CO1, CO2**
II	**Theory of Inference for Statement Calculus:** Validity using Truth Tables-Rules of Inference – Consistency of Premisesand Indirect Method Proof. **Predicate calculus:** Introduction to Predicates - Statement functions, Variable and Quantifiers - Predicate Formulas - Free and Bound Variables-Universe of Discourse.	**CO1,CO2**
III	**Recurrence Relations:** The Method of Characteristic Recurrence Relation. Roots – Solutions in Inhomogeneous	**CO1,CO3**
IV	**Relations and Directed Graphs:** Special Properties of Binary Relations-Equivalence Relations- Ordering Relations, Lattices, and Enumerations-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

1. Discrete Mathematical Structures with Applications to Computer Science, J P Trembly andR Manohar, 1988, McGraw-Hill **(Unit-I,II)**
2. Discrete Mathematics for Computer Scientists & Mathematicians, Joe L. Mott. Abraham Kandel and Theodore P. Baker, Second Edition, 2017, PHI. **(Unit-III,IV,V)**

References

1. Discrete Mathematics and its Applications, Kenneth H. Rosen, Seventh Edition, 2017,McGraw-Hill.

e-Resources & other digital material

1. https://www.geeksforgeeks.org/engineering-mathematics-tutorials/
2. https://www.tutorialspoint.com/discrete_mathematics/index.htm
3. http://www.alas.matf.bg.ac.rs/~mi10164/Materijali/DS.pdf
4. https://nptel.ac.in/courses/111107058/