Engineering Mathematics III (Discrete Mathematical Structures)

Course Code	19BS1302	Year	Π	Semester	Ι	
Course Category	Basic Sciences	Branch	CSE	Course Type	Theory	
Credits	3	L-T-P	3-0-0	Prerequisites	Basic Mathematics	
Continuous Internal 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 the concepts of propositional/predicate logic to solve problems.	L3				
CO3	Apply the method of characteristic roots for solving different recurrence relations.	L3				
CO4	Apply the concepts of graph theory for solving problems.	L3				

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													
CO3	3								3	3				
CO4	3													

Course Content							
UNIT-1	MathematicalLogic:Introduction-StatementsandNotations-Connectives(Negation,Conjunction,Disjunction)-StatementformulasandTruthTables,ConditionalandBi-conditional,Well-FormedFormulas,Tautologies,Equivalence of Formulas,Duality Law,Tautological Implication,FunctionallyCompleteSets of Connectives,Other Connectives.NormalForms:DisjunctiveNormalForms (DNF),ConjunctiveNormalForms (CNF),Principal ofDisjunctiveNormalForms (PDNF),Principal ofConjunctiveConjunctiveNormalForms (VENF),Principal ofDisjunctiveNormalForms (PDNF),Principal ofConjunctiveNormalForms (PCNF),						
UNIT-2	 Theory of Inference for Statement Calculus: Validity using Truth Tables- Rules of Inference – Consistency of Premises and Indirect Method Proof. Predicate calculus: Introduction to Predicates - Statement functions, Variable and Quantifiers- Predicate Formulas-Free and Bound Variables-Universe of Discourse. 	CO1,CO2					
UNIT-3	Recurrence Relations -The Method of Characteristic Roots-Solutions in Inhomogeneous Recurrence Relation.	CO1,CO3					
UNIT-4	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					
UNIT-5	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.						
Learning Resources							
Text Books	 1. Discrete Mathematical Structures with Applications to Computer Science, J P Trembly and R 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) 						
Reference Books	1. Discrete Mathematics and its Applications, Kenneth H. Rosen, Seventh Edition, 2017, McGraw-Hill.						
e- Resources & other digital material	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/						