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Engineering Mathematics III
(Discrete Mathematical Structures)
(Common with CSE)

Course Code	19BS1302	**Year**	II	**Semester**	I
Course Category	Basic Sciences	**Branch**	IT	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Basic Maths they studied at school level
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course Outcomes		**Blooms Taxonomy Level**
Upon successful completion of the course, the student will be able to		
CO1	Interpret the logical sentences using connectives and predicates.	L2
CO2	Apply rules of inference and methods of proof on Mathematical Logic and Predicate Calculus.	L3
CO3	Apply recurrence relations to solve problems in different domains.	L3
CO4	Construct Hasse diagram and various lattices from Partial Ordered Sets.	L3
CO5	Apply the concepts of trees and graphs for solving problems.	L3

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**
CO1	3	3	1										2	
CO2	3	3												
CO3	3	2	2										2	
CO4	3	2	1										2	
CO5	3	3	2										2	

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Mathematical Logic:** Introduction-Statements and Notations-Connectives-Statement formulas and Truth Tables. **Normal Forms:** Disjunctive Normal Forms (DNF), Conjunctive Normal Forms (CNF), Principal of Disjunctive Normal Forms (PDNF), Principal of Conjunctive Normal Forms (PCNF).	**CO1**
II	**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.	**CO2**
III	**Recurrence Relations**-The Method of Characteristic Roots-Solutions in Inhomogeneous Recurrence Relation.	**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	**CO4,CO5**
V	**Graphs-** Basic Concepts- Isomorphism's and Sub graphs-Trees and Their Properties - Spanning Trees-Planar Graphs-Euler's Formula-Multigraphs and Euler Circuits-Hamiltonian Graphs- Chromatic Numbers.	**CO5**

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)**

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/