



BAPATLA ENGINEERING COLLEGE::BAPATLA
(Autonomous)

DISCRETE MATHEMATICS																	
IB.Tech –II Semester (Code:20CM205)																	
Lectures	:	2 Hours/Week	Tutorial	:	1 Hour/Week	Practical	:	0									
CIEMarks	:	30	SEEMarks	:	70	Credits	:	3									
Pre-Requisite: None																	
Course Objectives: Students will learn how to																	
➤	Understand operations on discrete structures such as sets, functions, and relations. Formulates short proofs using methods of proof of an implication. Verify the correctness of an argument using propositional logic and truth tables. Construct mathematical arguments using logical connectives and quantifiers.																
➤	Verify the correctness of an argument using rules of inference for quantified propositions. Apply algorithms and use definitions to solve problems to prove statements in elementary number theory. Understand counting and indirect counting techniques and combinatorics in the context of discrete probability.																
➤	Understand sequences, generating functions, and recurrence relations. Understand and compute coefficients for generating functions. Understand and solve homogeneous recurrence relations.																
➤	Understand and solve inhomogeneous recurrence relations. Understand the properties of binary relations, partial orderings and lattices. Construct graphs and adjacency matrices for binary relations.																
Course Outcomes: After studying this course, the students will be able to																	
CO-1	Understand the basic principles of sets, relations, functions and inference rules for validating arguments.																
CO-2	Prove that the given statement is valid by using mathematical induction and utilize a variety of counting strategies to solve computational problems.																
CO-3	Discuss different methods for solving different types of recurrence relations.																
CO-4	Understand various operations and representations of a binary relation.																
Mapping of Course Outcomes with Program Outcomes & Program Specific Outcomes																	
		PO's												PSO's			
	CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
	CO-1	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-	
	CO-2	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-	
	CO-3	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-	
	CO-4	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-	
UNIT-1															(12 Hours)		
Foundations: Sets, Relations and Functions, Fundamentals of Logic, Logical Inferences, Methods of Proof of an implication, First order Logic & Other methods of proof.																	



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UNIT-2		(12 Hours)
<p>Rules of Inference for Quantified propositions, Mathematical Induction. Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with repetitions, Enumerating Permutation with Constrained repetitions..</p>		
UNIT-3		(12 Hours)
<p>Recurrence relations: Generating functions of sequences, Calculating Coefficients of Generating Functions Recurrence Relations: Solving recurrence relations by Substitution and generating functions, The methods of characteristic roots.</p>		
UNIT-4		(12 Hours)
<p>Recurrence Relations: solutions of Inhomogeneous recurrence relations. Relations: Special properties of binary relations, Operations on relation. Ordering relations, Lattice, Paths and Closures, Directed Graphs and Adjacency Matrices.</p>		
Text Books :	<p>Toe L. Mott, Abraham Kandel & Theodore P. Baker, "Discrete Mathematics for Computer Scientists & Mathematicians", PHI 2nd edition, 2012.</p>	
References:	<p>[1] C.L. Liu, "Elements of Discrete Mathematics", McGraw-Hill Education, 2nd edition [2] Rosen, "Discrete Mathematics"., McGraw-Hill Education, 8th edition.</p>	