



SWARNANDHRA

COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W G DT, Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF S & H

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
24BC2T01	DISCRETE MATHEMATICS	II	BCA	6	2025-26	16-02-26
COURSE OUTCOMES: Students are able to						
CO1	Understand and apply propositional and predicate calculus, including logical connectives, truth tables, and inference rules.(K2)					
CO2	Understand and apply basics theory concepts, including relations, functions, and the principle of inclusion and exclusion.(K2)					
CO3	Apply combinatorial techniques (permutations, combinations) and solve recurrence relations using generating functions.(K3)					
CO4	Understand and apply fundamental graph theory concepts, including graph representations, connectivity, and traversal algorithms.(K3)					
CO5	Understand and apply finite state machines, including DFA, NFA, and the pumping lemma for regular languages.(K2)					
UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book/ Reference	Contact Hour	Delivery Method
I	CO1 Understand and apply propositional and predicate calculus, including logical connectives, truth tables, and inference rules.(K2)	UNIT-I (Mathematical Logic)				
		1.1	Statements and Notations	T ₁ &T ₂	1	PPT& BB
		1.2	Connectives Well Formed Formulas Tautologies	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		1.3	Equivalence of formulae Duality law	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		1.4	Tautological implications Normal Forms	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		1.5	Theory of Inference Consistency of Premises	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		1.6	Predicative Logic StatementFunctions	T ₁ &T ₂	1	PPT& BB
T ₁ &T ₂	1					
1.7	Variables and Quantifiers	T ₁ &T ₂	1	PPT& BB		
1.8	Inference Theory for Predicate Calculus	T ₁ &T ₂	1	PPT& BB		
				Total	14	



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II	CO2 Understand and apply basics theory concepts, including relations, functions, and the principle of inclusion and exclusion.(K2)	UNIT-II (Sets and Functions)					
		2.1	Sets, Relations	T ₁ & T ₂	1	PPT& BB	
		2.2	Functions	T ₁ &T ₂	1	PPT& BB	
		2.3	Closures of Equivalence Relations	T ₁ &T ₂	1	PPT& BB	
		2.4	Partial ordering well ordering	T ₁ &T ₂	1	PPT& BB	
				T1&T2	1		
		2.5	Lattice Problems	T ₁ &T ₂	1	PPT& BB	
				T1&T2	1		
		2.6	Sum of products product of sums	T ₁ &T ₂	1	PPT& BB	
T1&T2	1						
2.7	Principle of Inclusions and Exclusions	T1&T2	1	PPT& BB			
			Total	10			
III	CO3 Apply combinatorial techniques (permutations, combinations) and solve recurrence relations using generating functions.(K3)	UNIT-III (Combinatory)					
		3.1	Permutations	T ₁ &T ₂	1	PPT& BB	
		3.2	Combinations	T ₁ &T ₂	1	PPT& BB	
				T1&T2	1		
		3.3	Pigeonhole principle	T ₁ &T ₂	1	PPT& BB	
				T1&T2	1		
		3.4	Linear Recurrence Relations	T ₁ &T ₂	1	PPT& BB	
				T1&T2	1		
		3.5	Non-linear Recurrence Relations	T ₁ &T ₂	1	PPT& BB	
				T ₁ &T ₂	1		
		3.6	Solving Recurrence Relation using Generating Functions.	T ₁ &T ₂	1	PPT& BB	
				T ₁ &T ₂	1		
					Total	11	
IV	CO4 Understand and apply fundamental graph theory concepts, including graph representations,	UNIT-IV (Graphs)					
		4.1	Introduction to graphs Graphs terminologies	T ₁ &T ₂	1	PPT& BB	
				T1&T2	1		
		Representation of graphs	T ₁ &T ₂	1			



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	connectivity, and traversal algorithms.(K3)	4.2	Isomorphism	T ₁ &T ₂	1	PPT& BB
		4.3	Connectivity	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.4	Euler and Hamiltonian Paths	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.5	Introduction to tree Tree traversals	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	PPT& BB
		4.6	Breadth first search, Depth first search	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	PPT& BB
		4.7	cut- set, cut-vertex.	T ₁ &T ₂	1	PPT& BB
Total					13	
V	CO5 Understand and apply finite state machines, including DFA, NFA, and the pumping lemma for regular languages.(K2)	UNIT-V (Modeling Computation)				
		4.1	Finite State Machine	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.2	Deterministic Finite Automata (DFA)	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.3	Non-Deterministic Finite Automata Lemma for Regular Language (NFA)	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		4.4	Grammars and Language	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.5	Application of Pumping	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.6		T ₁ &T ₂	1	PPT& BB
T ₁ &T ₂	1					
Total					12	
Cumulative Proposed Periods					60	
Text Books:						
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					
T1	Kenneth H. Rosen, Discrete Mathematics and its Applications with Combinatory and Graph Theory, SIE, 7/e, 2017					
T2	J.P Tremblay and R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, TMH, 2017					
T3	C. L. Liu P. Mohapatra, Elements of Discrete Mathematics -A Computer Oriented Approach, 4/e, Tata Mc Graw Hill, 2023					
Reference Books:						
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					



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R1	Oscar Levin, Discrete Mathematics, Anopen Introduction, 3/e, 2025
R2	Dr. Swapan Kumar Sarkar, A Textbook of Discrete Mathematics, S Chand, 10/e, 2025
Web Details	
1	https://onlinecourses.nptel.ac.in/noc22_cs123/preview
2	https://discrete.openmathbooks.org/preview/
3	https://mathworld.wolfram.com/topics/DiscreteMathematics.html
4	https://www.csie.ntu.edu.tw/~sylee/courses/dm/resources.htm

	Name	Signature with Date
i. Faculty	Mr. P.V.Narayana (BCA- A&B)	P.V. Narayana
ii. Course Coordinator	Mr. P.V.Narayana	P.V. Narayana
iii. Module Coordinator	Mr.K.D.N.Murthy	Mr.K.D.N.Murthy
iv. Programme Coordinator	Dr.V. Swaminadhan	Dr.V. Swaminadhan


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