



SWARNANDHRA

COLLEGE OF ENGINEERING & TECHNOLOGY

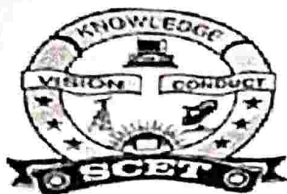
(AUTONOMOUS)

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
Seetharamapuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF BASIC SCIENCES & HUMANITIES

TEACHING PLAN

Course Code	Course Title	Sem	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
23BS3T03	DISCRETE MATHEMATICS & GRAPH THEORY	III	CSE, CCS, CB, CDS, AIDS, AIML & IT	60/6	2025-26	14-07-2025
COURSE OUTCOMES: Students are able to						
1	Comprehend mathematical principles and logic(K3)					
2	Apply the concepts and perform the basic operations related to sets ,relations and functions(K3))					
3	Apply counting principles and Generating functions to formulate and solve complex problems (K3)					
4	Apply fundamental concepts in graph theory (K3)					
5	Apply graph theory concepts in data structures and network theory effectively. (K3)					
UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	CO1-Students are able to comprehend mathematical principles and logic(K4)	MATHEMATICAL LOGIC				
		1.1	Propositional Calculus: Statements and Notations Connectives	T ₁ & T ₂	1	Chalk & Talk, Active Learning, PPT & Tutorial
				T ₁ & T ₂	1	
		1.2	Well Formed Formulas, Truth Tables	T ₁ & T ₂	1	
		1.3	Tautologies	T ₁ & T ₂	1	
		1.4	Equivalence of formulae	T ₁ & T ₂	1	
		1.5	Duality law, tautological implications	T ₁ & T ₂	1	
		1.6	Normal Forms Disjunctive and Conjunctive normal forms	T ₁ & T ₂	1	



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		1.7	Principal disjunctive and conjunctive normal forms	$T_1 \& T_2$	1	
		1.8	Theory of Inference for Statement Calculus	$T_1 \& T_2$	1	
		1.9	Consistency of Premises,	$T_1 \& T_2$	1	
		1.10	Indirect Method of Proof	$T_1 \& T_2$	1	
		1.11	Predicate Calculus: Predicates, Predicative Logic, Statement Functions	$T_1 \& T_2$	1	
		1.12	Variables and Quantifiers, Free and Bound Variables	$T_1 \& T_2$	1	
		1.13	Inference Theory for Predicate Calculus	$T_1 \& T_2$	1	
Total					14	
II	CO2-Students are able to apply the concepts and perform the basic operations related to sets ,relations and functions(K3)	SET THEORY				Chalk & Talk, Active Learning, PPT & Tutorial
		2.1	Sets: Operations on Sets	$T_1 \& T_2$	1	
		2.2	Principle of Inclusion-Exclusion(without proof)	$T_1 \& T_2$	1	
		2.3	Relations: Properties, Operations	$T_1 \& T_2$	1	
				$T_1 \& T_2$	1	
		2.4	Partition and Covering, Transitive Closure	$T_1 \& T_2$	1	
		2.5	Equivalence Relation	$T_1 \& T_2$	1	
				$T_1 \& T_2$	1	
		2.6	Compatibility Relation	$T_1 \& T_2$	1	
		2.7	Partial ordering Relation	$T_1 \& T_2$	1	
		2.8	Hasse diagram	$T_1 \& T_2$	1	
		2.9	Functions: Bijective	$T_1 \& T_2$	1	
		2.10	Composite,Inverse Functions	$T_1 \& T_2$	1	
2.11	Permutation Function	$T_1 \& T_2$	1			
2.12	Recursive Function	$T_1 \& T_2$	1			
Total					14	



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III	CO3-The student should be able to apply counting principles and Generating functions to formulate and solve complex problems (K3)	COMBINATORICS AND RECURRENCE RELATIONS				Chalk & Talk, Active Learning, PPT & Tutorial
		3.1	Basis of Counting, Permutations	T_1, T_2	1	
		3.2	Permutations with Repetitions	T_1, T_2	1	
		3.3	Circular and Restricted Permutations	T_1, T_2	1	
		3.4	Combinations Restricted Combinations	T_1, T_2	1	
		3.5	Binomial and Multinomial Coefficients and Theorems(without proof)	T_1, T_2	1	
				T_1, T_2	1	
		3.6	Generating Functions	T_1, T_2	1	
		3.7	Function of Sequences, Partial Fractions	T_1, T_2	1	
		3.8	Calculating Coefficient of Generating Functions	T_1, T_2	1	
				T_1, T_2	1	
		3.9	Recurrence Relations, Formulation as Recurrence Relations	T_1, T_2	1	
		3.10	Solving Recurrence Relations by Substitution	T_1, T_2	1	
		3.11	Solving Recurrence Relations by Generating Functions	T_1, T_2	1	
		3.12	Solving Recurrence Relations by, Method of Characteristic Roots	T_1, T_2	1	
3.13	Solving Inhomogeneous Recurrence Relations	T_1, T_2	1			
Total				15		



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GRAPH THEORY						
IV	CO4-The student should be able to apply fundamental concepts in graph theory(K3)	4.1	Basic Concepts:Graph Theory and its Applications	T ₁ & T ₂	1	Chalk & Talk, Active Learning, PPT & Tutorial
		4.2	Subgraphs	T ₁ & T ₂	1	
		4.3	Graph Representations: Adjacency and Incidence Matrices	T ₁ & T ₂	1	
				T ₁ & T ₂	1	
		4.4	Isomorphic Graphs	T ₁ & T ₂	1	
		4.5	Paths and Circuits	T ₁ & T ₂	1	
		4.6	Eulerian Graphs	T ₁ & T ₂	1	
		4.7	Hamiltonian Graphs	T ₁ & T ₂	1	
Total					8	
MULTI GRAPHS						
V	CO5-The student should be able to apply graph theory concepts in data structures and network theory effectively. (K3)	5.1	Multigraphs, Bipartite and Planar Graphs	T ₁ & T ₂	1	Chalk & Talk, Active Learning, PPT & Tutorial
		5.2	Euler's Theorem	T ₁ & T ₂	1	
		5.3	Graph Colouring and Covering Chromatic Number	T ₁ & T ₂	1	
		5.4	Spanning Trees, Prim's Algorithm	T ₁ & T ₂	1	
				T ₁ & T ₂	1	
		5.5	Spanning Trees Kruskal's Algorithm	T ₁ & T ₂	1	
		5.6	BFS Spanning Trees	T ₁ & T ₂	1	
		5.7	DFS Spanning Tree	T ₁ & T ₂	1	
Total					9	
CUMULATIVE PROPOSED PERIODS					60	
Text Books:						
S.No.	BOOK TITLE/AUTHORS/PUBLISHER					
T1	Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay and P. Manohar, Tata McGraw Hill.					
T2	Mathematical Foundation for Computer Science,S.Santha,E.V.Prasad,Cengage Publications.					



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Reference Books:	
S.No.	BOOK TITLE/AUTHORS/PUBLISHER
R1	Discrete Mathematics for Computer Scientists and Mathematicians, J. L.Mott, A. Kandel and T. P. Baker, 2nd Edition, Prentice Hall of India.
R2	Mathematical Foundation of Computer Science, Dr.J.RajendraPrasad, T.RamaRao, A.MadhanaMohana Rao, University Science Press.
Web Details	
1	https://onlinecourses.nptel.ac.in/noc16_ma01/preview
2	https://stanford.edu/~rezab/classes/cme305/W17/
3	https://nptel.ac.in/courses/106106094/
4	https://nptel.ac.in/courses/111107058/

	Name	Signature with Date
i. Faculty I	Dr.P.PremDelphy	<i>[Signature]</i> 5/7/25
ii. Faculty II	Mr.M.RavindraBabu	<i>[Signature]</i> 5/7
iii. Faculty III	Mr.T.V.LakshmanaRao	<i>[Signature]</i>
iv. Faculty IV	Mrs.P.Sujatha	<i>P. Sujatha</i>
v. Faculty V	Ms. N. Lavanya	<i>N. Lavanya</i>
vi. Faculty VI	Mrs.P.Ester Rani	<i>P. Ester</i>
vii. Course Coordinator	Mr. M. RavindraBabu	<i>[Signature]</i> 5/7
viii. Module Coordinator	Dr.P.PremDelphy	<i>[Signature]</i> 5/7/25
ix. Head of the Department	Dr. V.Swaminadham	<i>V. Swaminadham</i>

[Signature]
Principal