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 MATHEMATICS

TEACHING PLAN

Course Code	Course Title	Sem	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
20IT4T01	DISCRETE MATHEMATICS	IV	CSE(DS), AIDS	60/16	2023-24	03-01-2024

COURSE OUTCOMES: Students are able to

1	identify programming errors efficiently through enhanced logical capabilities (K3)
2	find a general solution of recurrence equation (K3)
3	learn set theory, graph of the relations which are used in data structures (K3)
4	explain the concepts in graph theory (K3)
5	apply graph theory concepts in core subjects such as data structures and network theory effectively. (K3)

UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
			Mathematical Logic			
I	Students are able to identify programming errors efficiently through enhanced logical capabilities CO1 (K3)	1.1	Connectives, negation, conjunction, disjunction conditional, bi-conditional,	T_1 & T_2	1	Chalk & Talk, Active Learning, PPT & Tutorial
				T_1 & T_2	1	
		1.2	statement formula and Truth Tables	T_1 & T_2	1	
		1.3	well formed formulae, tautologies, equivalence, implication	T_1 & T_2	1	
				T_1 & T_2	1	
		1.4	equivalence of formulae,	T_1 & T_2	1	
		1.5	duality, tautological implications,	T_1 & T_2	1	

		1.6	functionally complete set of connectives, other connectives	T_1 & T_2	1	
		1.7	principal disjunctive and conjunctive normal forms	T_1 & T_2	1	
		1.8	inference calculus, rules of inference	T_1 & T_2	1	
		1.9	consistency of premises, indirect method of proof	T_1 & T_2	1	
		1.10	Theory of inference for the statement calculus validity using Truth tables.	T_1 & T_2	1	
				Total	**12**	
		RECURRENCE RELATIONS				
II	Students are able to find a general solution of recurrence equation (K3)	2.1	Generating Function of Sequences	T_1 , T_2 & R_1	1	Chalk & Talk, Active Learning, PPT & Tutorial
		2.2	Calculating Coefficients of generating functions	T_1 & T_2	1	
				T_1 & T_2	1	
		2.3	solving recurrence relation by generating functions	T_1 , T_2 & R_1	1	
				T_1 , T_2 & R_1	1	
		2.4	solving recurrence relation by substitution		1	
				T_1 & T_2	1	
		2.5	the method of Characteristic roots	T_1 , T_2 & R_1	1	
				T_1 & T_2	1	
				T_1 & T_2	1	
		2.6	Solution of Inhomogeneous Recurrence Relation	T_1 , T_2 & R_1	1	
				T_1 & T_2	1	

				Total	**12**	
III	The student should be able learn set theory, graph of the relations which are used in data structures.(CO3) (K3).	**SET THEORY AND RELATIONS**				
		3.1	Relations and ordering, Relations, Properties of binary Relations in a set	T_1 , T_2 & R_1	1	Chalk & Talk, Active Learning, PPT & Tutorial
		3.2	Relation Matrix and the Graph of a Relation	T_1 , T_2 & R_1	1	
		3.3	Partition and covering of a set	T_1 , T_2 & R_1	1	
		3.4	Equivalence Relation	T_1 , T_2 & R_1	1	
				T_1 , T_2 & R_1	1	
		3.5	Compatibility Relation	T_1 , T_2 & R_1	1	
		3.6	Composition of Binary Relations	T_1 , T_2 & R_1	1	
		3.7	Partial ordering, Hasse diagram	T_1 , T_2 & R_1	1	
				T_1 , T_2 & R_1	1	
		3.8	Principle of Inclusion-Exclusion	T_1 , T_2 & R_1	1	
				T_1 , T_2 & R_1	1	
		3.9	Pigeon hole principle and its applications	T_1 , T_2 & R_1	1	
				Total	**12**	
IV	The student should be able to explain the concepts in graph theory (CO4) (K3)	**GRAPHS THEORY**				
		4.1	Basic Concepts	T_1 , T_2 & R_1	1	Chalk & Talk, Active Learning, PPT & Tutorial
		4.2	Representation of Graph	T_1 & T_2	1	
				T_1 & T_2	1	
		4.3	Sub graphs, Multigraphs	T_1 & T_2	1	
		4.4	Planar graphs	T_1 & T_2	1	
		4.5		T_1 , T_2 & R_1	1	

			Euler Paths, Euler circuits	T_1, T_2 & R_1	1	
		4.6	Hamiltonian Graphs	T_1 & T_2	1	
		4.7	Graph Isomorphism	T_1 & T_2	1	
				T_1 & T_2	1	
		4.8	Related Problems	T_1 & T_2	1	
		4.9	Chromatic Number	T_1 & T_2	1	
				Total	**12**	
		TREES				
V	The student should be able to apply graph theory concepts in core subjects such as data structures and network theory effectively. (CO5) (K3)	5.1	Spanning Tree	T_1 & T_2	1	Chalk & Talk, Active Learning, PPT & Tutorial
		5.2	Minimal Spanning Trees	T_1 & T_2	1	
		5.3	BFS Algorithm	T_1 & T_2	1	
				T_1 & T_2	1	
		5.4	DFS Algorithm	T_1 & T_2	1	
				T_1 & T_2	1	
		5.5	Kruskal's Algorithm	T_1 & T_2	1	
				T_1 & T_2	1	
		5.6	Prim's Algorithm	T_1 & T_2	1	
				T_1 & T_2	1	
		5.7	Binary trees	T_1 & T_2	1	
		5.8	Planar graphs	T_1 & T_2	1	
				Total	**12**	
			CUMULATIVE PROPOSED PERIODS		**60**	

Text Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
T1	J.P. Tremblay and R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw Hill, 2017.
T2	Joe L. Mott, Abraham Kandel and T. P. Baker, Discrete Mathematics for computer scientists & Mathematicians, 2/e, Prentice Hall of India Ltd, 2008.

Reference Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
R1	Keneth. H. Rosen, Discrete Mathematics and its Applications, 8/e, Tata McGraw-Hill, 2021
R2	Richard Johnsonburg, Discrete Mathematics, 8/e, Pearson Education, 2018
R3	Narsingh Deo, Graph Theory with Applications to Engineering and Computer Science, Prentice Hall of India, 2006.

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	Mr. M. ravindra babu	
iii.	Course Coordinator	P. Durga Bhavani	
iv.	Module Coordinator	Dr. E. M. Victoria	
v.	Programme Coordinator	Dr. V. Swaminadham	

Principal