



# 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	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
	<b>DISCRETE MATHEMATICS</b>	<b>III</b>	<b>CSE (A,B, SHIFT) IT</b>	<b>40/16</b>	<b>2020-21</b>	<b>17-08-2020</b>

#### **COURSE OUTCOMES**

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

UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
<b>I</b>	Students are able to identify programming errors efficiently through enhanced logical capabilities CO1 (K3)	<b>Mathematical Logic</b>				
		1.1	Connectives, negation, conjunction, disjunction conditional, bi-conditional,	T <sub>1</sub> & T <sub>2</sub>	<b>1</b>	PPT
		1.2	statement formula and Truth Tables	T <sub>1</sub> & T <sub>2</sub>	<b>1</b>	Chalk & Talk
		1.3	well formed formulae, tautologies, tautology, equivalence, implication	T <sub>1</sub> & T <sub>2</sub>	<b>1</b>	Chalk & Talk
		1.4	equivalence of formulae,	T <sub>1</sub> & T <sub>2</sub>	<b>1</b>	Chalk & Talk
		1.5	duality, tautological implications,	T <sub>1</sub> & T <sub>2</sub>	<b>1</b>	Chalk & Talk



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		1.6	functionally complete set of connectives, other connectives,	$T_1$ & $T_2$	<b>1</b>	Chalk & Talk
		1.7	principal disjunctive and conjunctive normal forms	$T_1$ & $T_2$	<b>1</b>	Chalk & Talk
		1.8	inference calculus, rules of inference,	$T_1$ & $T_2$	<b>1</b>	Chalk & Talk
		1.9	consistency of premises, indirect method of proof	$T_1$ & $T_2$	<b>1</b>	Chalk & Talk
		1.10	Theory of inference for the statement calculus, validity using Truth tables.	$T_1$ & $T_2$	<b>1</b>	Chalk & Talk
<b>Total</b>					<b>10</b>	
		<b>RECURRENCE RELATIONS</b>				
<b>II</b>	The student should be able to construct the probability distribution of a random variable, based on a real –world situation, and use it to compute expectation and variance. Also compute probabilities based on practical situations using the binomial, poisson and normal distributions(CO2) (K3).	2.1	Generating Function of Sequences, Calculating Coefficient of generating functions and Generating functions	$T_1$ & $T_2$	<b>2</b>	PPT
		2.2	Recurrence relations, solving recurrence relation by substitution	$T_1$ & $T_2$	<b>1</b>	Chalk & Talk
		2.3	the method of Characteristic roots	$T_1$ & $T_2$	<b>2</b>	Chalk & Talk
		2.4	Solution of Inhomogeneous Recurrence Relation	$T_1$ & $T_2$	<b>2</b>	Chalk & Talk
<b>Total</b>					<b>7</b>	
		<b>SET THEORY AND RELATIONS</b>				
<b>III</b>	The student should be able learn set theory, graph of the relations	3.1	Relations and ordering, Relations, Properties of binary Relations in a set,	$T_1$ & $T_2$	<b>1</b>	PPT



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	which are used in data structures. (CO3) (K3).	3.2	Relation Matrix and the Graph of a Relation	$T_1$ & $T_2$	1	PPT
		3.3	partition and covering of a set	$T_1$ & $T_2$	1	Chalk & Talk
		3.4	Equivalence Relation	$T_1$ & $T_2$	1	Chalk & Talk
		3.5	Compatibility Relation	$T_1$ & $T_2$	1	Chalk & Talk
		3.6	Composition of Binary Relations,	$T_1$ & $T_2$	1	Chalk & Talk
		3.7	Partial ordering, Hasse diagram,	$T_1$ & $T_2$	1	Chalk & Talk
		3.8	Principle of Inclusion	$T_1$ & $T_2$	1	Chalk & Talk
<b>Total</b>					<b>8</b>	
<b>GRAPHS THEORY</b>						
IV	The student should be able to explain the concepts in graph theory (CO4) (K3)	4.1	Basic Concepts, Representation of Graph,	$T_1$ & $T_2$	1	Chalk & Talk
		4.2	Sub graphs, Multigraphs.	$T_1$ & $T_2$	1	Chalk & Talk
		4.3	Planar graphs, Euler Paths, Euler circuits,	$T_1$ & $T_2$	2	Chalk & Talk
		4.4	Hamiltonian Graphs	$T_1$ & $T_2$	1	Chalk & Talk
		4.5	Graph Isomorphism and its related Problems	$T_1$ & $T_2$	2	Chalk & Talk
		4.6	Chromatic Number	$T_1$ & $T_2$	1	Chalk & Talk
<b>Total</b>					<b>8</b>	
V		<b>TEST OF HYPOTHESIS</b>				



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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 minimal Spanning Trees,	T <sub>1</sub> & T <sub>2</sub>	2	Chalk & Talk
	5.2	BFS Algorithm.	T <sub>1</sub> & T <sub>2</sub>	1	Chalk & Talk
	5.3	DFS, Algorithm			
	5.4	Kruskal's Algorithm	T <sub>1</sub> & T <sub>2</sub>	1	
	5.5	Prim's Algorithm,	T <sub>1</sub> & T <sub>2</sub>	1	Chalk & Talk
	5.6	Binary trees	T <sub>1</sub> & T <sub>2</sub>	1	
<b>Total</b>				<b>7</b>	
<b>CUMULATIVE PROPOSED PERIODS</b>				<b>40</b>	
<b>Text Books:</b>					
<b>S.No.</b>	<b>AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION</b>				
<b>T1</b>	J.P. Tremblay and R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw Hill, 1997.				
<b>T2</b>	Joe L. Mott, Abraham Kandel and T. P. Baker, Discrete Mathematics for computer scientists & Mathematicians, 2/e, Prentice Hall of India Ltd, 2012.				
<b>Reference Books:</b>					
<b>S.No.</b>	<b>AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION</b>				
<b>R1</b>	Keneth. H. Rosen, Discrete Mathematics and its Applications, 6/e, Tata McGraw-Hill, 2009				
<b>R2</b>	Richard Johnsonburg, Discrete Mathematics, 7/e, Pearson Education, 2008				
<b>R3</b>	Narsingh Deo, Graph Theory with Applications to Engineering and Computer Science, Prentice Hall of India, 2006.				
<b>Web Details</b>					
<b>1</b>	<a href="https://onlinecourses.nptel.ac.in/noc16_ma01/preview">https://onlinecourses.nptel.ac.in/noc16_ma01/preview</a>				
<b>2</b>	<a href="https://stanford.edu/~rezab/classes/cme305/W17/">https://stanford.edu/~rezab/classes/cme305/W17/</a>				
<b>3</b>	<a href="https://nptel.ac.in/courses/106106094/">https://nptel.ac.in/courses/106106094/</a>				
<b>4</b>	<a href="https://nptel.ac.in/courses/111107058/">https://nptel.ac.in/courses/111107058/</a>				

		Name	Signature with Date
i.	Faculty	Dr. N.N.V.Sakuntala, Mrs. S.S.V.Santhi	
ii.	Course Coordinator	Dr. N.N.V.Sakuntala	
iii.	Module Coordinator	Ch. Peddiraju	
iv.	Programme Coordinator	Dr. S. Dharaja Devi	

**Principal**