



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 INFORMATION TECHNOLOGY

TEACHING PLAN

Course Code	Course Title	Semester	Branch	Contact Periods /Week	Academic Year	Date of commencement of Semester
20IT6E01	DESIGN AND ANALYSIS OF ALGORITHMS	VI	IT	6	2024-25	18-11-2024
COURSE OUTCOMES						
1	Analyze the asymptotic runtime complexity of algorithms for real world problems developed using different algorithmic methods. (K4)					
2	Identify the optimal solutions by using advanced design and analysis of algorithm techniques like Divide & conquer and greedy method. (K3)					
3	Illustrate the fundamentals of Dynamic Programming methods along with its applications. (K2)					
4	Apply the search space and optimization problem techniques like backtracking and branch and bound method to solve problems optimally where advanced algorithm design techniques fail to find solution. (K3)					
5	Distinguish the problems and its complexity as polynomial and NP problems and can formulate some real world problems to abstract mathematical problems.					
UNIT	Out Comes / Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Reference	Contact Hour	Delivery Method
I	CO – 1	1.1	Introduction to Algorithm	T1,T2	1	Chalk & Board Power point presentation Assignment Test
		1.2	Pseudo code for expressing Algorithm	T1,T2	1	
		1.3	performance analysis- space complexity	T1,T2	1	
		1.4	Time Complexity analysis	T1,T2	1	
		1.5	Asymptotic Notations	T1,T2	1	
		1.6	probabilistic analysis	T1,T2	1	
		1.7	disjoint set operation	T1,T2	1	
		1.8	union and find algorithms	T1,T2	1	
		1.9	spanning trees	T1,T2	1	
		1.10	spanning trees	T1,T2	1	
		1.11	connected components	T1,T2	1	
		1.12	biconnected components	T1,T2	1	
Total					12	



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II	CO – 2	2.1	Divide and Conquer: The General Method	T1,R1	1	Chalk & Board
		2.2	Binary search	T1,R1	1	
		2.3	Quick Sort methodology with example	T2,R2	1	
		2.4	Quick Sort algorithm analysis	T2,R2	1	
		2.5	Merge Sort methodology with example	T2,R2	1	
		2.6	Merge Sort algorithm analysis	T2,R2	1	
		2.7	Strassen's matrix multiplication	T2,R2	1	Power point presentation
		2.8	Greedy Method: General Method, applications	T1,T2	1	
		2.9	Job Sequencing with deadlines	T1,T2	1	Assignment
		2.10	Knapsack Problem- General Methodology	T1,T2	1	
		2.11	Examples for Knapsack Problem	T1,T2	1	Test
		2.12	Minimum cost spanning trees – Prim's algorithm	T1,T2	1	
		2.13	Minimum cost spanning trees – Kruskal's algorithm	T1,T2	1	
		2.14	Single Source Shortest Paths	T1,T2	1	
Total					14	
III	CO – 3	3.1	Dynamic Programming: General Method, Applications	T1,T2	1	Chalk & Board
		3.2	Matrix chain multiplication	T1,T2	1	
		3.3	Optimal Binary Search Trees	T1,T2	1	
		3.4	Optimal Binary Search Trees	T1,T2	1	
		3.5	Optimal Binary Search Trees	T1,T2	1	
		3.6	0/1 Knapsack problem	T1,T2	1	
		3.7	0/1 Knapsack problem	T1,T2	1	Power point presentation
		3.8	All pairs shortest paths	T1,T2	1	
		3.9	Single Source Shortest Paths– General Weights (Bellman Ford Algorithm)	T1,T2	1	Assignment
		3.10	Single Source Shortest Paths– General Weights (Bellman Ford Algorithm)	T1,T2	1	
		3.11	Travelling Salesperson problem	T1,T2	1	Test
		3.12	Travelling Salesperson problem	T1,T2	1	
		3.13	Travelling Salesperson problem	T1,T2	1	



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		3.14	reliability design	T1,T2	1	
		3.15	reliability design	T1,T2	1	
Content beyond syllabus		3.16	Reliability design problem using Dynamic Programming	T1,T2	1	
Total					16	
IV	CO – 4	4.1	Backtracking: General Method	T1,T2	1	Chalk & Board Power point presentation Assignment Test
		4.2	8-Queens Problem constraints	T1,T2	1	
		4.3	State space tree for 8-Queens Problem	T1,T2	1	
		4.4	Sum of Subsets problem	T1,T2	1	
		4.5	Graph Coloring	T1,T2	1	
		4.6	Hamiltonian cycles	T1,T2	1	
		4.7	Branch and Bound: The General Method	T1,T2	1	
		4.8	0/1 Knapsack Problem	T1,T2	1	
		4.9	0/1 Knapsack Problem	T1,T2	1	
		4.10	Travelling Salesperson problem LC Branch and Bound solution	T1,T2	1	
		4.11	Travelling Salesperson problem LC Branch and Bound solution	T1,T2	1	
		4.12	Travelling Salesperson problem FIFO Branch and Bound solution	T1,T2	1	
		4.13	Travelling Salesperson problem FIFO Branch and Bound solution	T1,T2	1	
Content beyond syllabus		4.14	Hamiltonian cycles	T1	1	
Total					14	
V	CO – 5	5.1	NP Hard and NP Complete Problems	T1,R1	1	Chalk & Board Power point presentation Assignment Test
		5.2	Basic Concepts of NP Hard and NP Complete Problems	T1,R1	1	
		5.3	Cook's theorem	T1,R1	1	
		5.4	non deterministic algorithms	T1,R1	1	
		5.5	non deterministic algorithms	T1,R1	1	
		5.6	NP Hard Graph Problems	T1,R1	1	
		5.7	NP Hard Graph Problems	T1,R1	1	
		5.8	Clique Decision Problem (CDP)	T1,R1	1	
		5.9	Clique Decision Problem (CDP)	T1,R1	1	



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	5.10	Chromatic Number Decision Problem (CNDP)	T1,R1	1	
	5.11	Chromatic Number Decision Problem (CNDP)	T1,R1	1	
Total				11	
CUMULATIVE PROPOSED PERIODS				67	

Text Books:


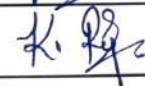
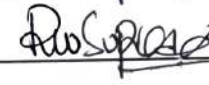
S. No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1.	Ellis Horowitz, Satraj Sahni and Rajasekharam, Fundamentals of Computer Algorithms, Universities Press.
2.	Steven S. Skiena, The Algorithm Design Manual, 2nd edition, Springer.
3	T.H.Cormen, C.E.Leiserson, R.L.Rivest and C.Stein, Introduction to Algorithms, second edition, PHI Pvt. Ltd.

Reference Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Anany Levitin, Introduction to the Design and Analysis of Algorithms, PEA
2	2. Parag Himanshu Dave, Himansu B Alachandra Dave, Design and Analysis of Algorithms, Pearson Education.
3	3. R.C.T. Lee, S.S.Tseng, R.C.Chang and T.Tsai, Introduction to Design and Analysis of Algorithms A strategic approach, McGraw Hill.
4	4. Aho, Ullman and Hopcroft, Design and Analysis of algorithms, Pearson education.

Web Details:

1	https://www.tutorialspoint.com/advanced_data_structures/index.asp
2	http://peterindia.net/Algorithms.html
3	Abdul Bari, Introduction to Algorithms (youtube.com)

	Name	Signature with Date
i. Faculty	Mrs. V.Sivani	
ii. Module Coordinator	Mr. K.Raja	
iii. Programme Coordinator	Dr. RVSV Prasad	


Principal