SRINIVAS UNIVERSITY
COLLEGE OF ENGINEERING & TECHNOLOGY
Department Of Computer Science and Engineering
TEACHING/LESSON PLAN (EVEN Semester 2021-22)

Subject Code		19SCS42	Title	DESIGN AND ANALYSIS OF ALGORITHMS		Class	IV Semester CSE – 'A'		
Prerequisites		Data Structures		Faculty Name		Ms. Swarna H.R.			
Credits	04	Hours/week	L-T-P: 4-0-0	CIE Marks	50	SEE Marks	50	Total Hours	50

Course Objectives:

This course will enable students to

- Analyze the asymptotic performance of algorithms.
- Explain various computational problem solving techniques.
- Apply appropriate method to solve a given problem and describe various methods of algorithm analysis.
- Describe the classes P, NP, and NP Complete.

Course Outcomes of the Course:

On Completion of this Course the Student was able to,

CO id	Course Outcome
CO1	Estimate the computational complexity of different algorithms using asymptotic analysis
CO2	Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Derive and solve recurrences describing the performance of divide-and-conquer algorithms
CO3	Describe the greedy paradigm and explain when an algorithmic design situation calls for it.
CO4	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it.
CO5	Able to describe the classes P, NP, and NP Complete and be able to prove that a certain problem is NP-Complete

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	✓										
CO2	✓	✓	✓									
CO3	✓	✓	✓									
CO4	✓	✓	✓									
CO5	✓	✓										

Lesson/Teaching Plan of the Course:

Hour No.	Plan Date	Actual Date	Topic to be covered	CO Mapping	Mode of Delivery	Text/ Reference book
1	14 Mar 2022		**MODULE -1:** What is an Algorithm? , Algorithm Specification	CO1	PPT	T2
2	15 Mar 2022		Analysis Framework , Performance Analysis:	CO1	Chalk & talk	T2
3	18 Mar 2022		Space complexity, Time complexity , Asymptotic Notations:	CO1	Chalk & talk	T1
4	19 Mar 2022		Big- Oh notation (O), Omega notation (#), Problems	CO1	Chalk & talk	T1

5	21 Mar 2022		Theta notation (Q), Little-oh notation (o), Problems	CO1	Chalk & talk	T1
6	22 Mar 2022		Mathematical analysis of Non Recursive Algorithms with Examples	CO1	Chalk & talk	T1
7	25 Mar 2022		Mathematical analysis of recursive Algorithms with Examples	CO1	Chalk & talk	T1
8	26 Mar 2022		Important problem types: Sorting, Searching	CO1	PPT	T1
9	28 Mar 2022		Combinatorial Problems, String processing, Graph Problems	CO1	PPT	T1
10	29 Mar 2022		Fundamental Data Structures: Stacks,Queues, Graphs, Trees, Sets and Dictionaries	CO1	PPT	T1
11	1 Apr 2022		**MODULE-2:** Introduction to Divide and conquer method.	CO2	PPT	T2
12	4 Apr 2022		General method, Binary search	CO2	PPT	T2
13	5 Apr 2022		Recurrence equation for divide and conquer	CO2	Chalk & talk	T2
14	8 Apr 2022		Finding the maximum and minimum	CO2	Chalk & talk	T2
15	9 Apr 2022		Merge sort, Problems on mergesort	CO2	Chalk & talk	T2
16	16 Apr 2022		Quick sort, Problems on quicksort	CO2	Chalk & talk	T1
17	18 Apr 2022		Strassen's matrix multiplication	CO2	Chalk & talk	T1
18	19 Apr 2022		Advantages and Disadvantages of divide and conquer	CO2	PPT	T1
19	22 Apr 2022		Decrease and Conquer Approach: Topological Sort	CO2	Chalk & talk	T1
20	23 Apr 2022		Topological Sort, Problems	CO2	Chalk & talk	T1
21	25 Apr 2022		**MODULE -3:** Introduction to Divide and Greedy method.	CO3	PPT	T2
22	26 Apr 2022		General method, Coin Change Problem	CO3	Chalk & talk	T2
23	29 Apr 2022		Knapsack Problem, Greedy method knapsack problem	CO3	Chalk & talk	T1
24	30 Apr 2022		Job sequencing with deadlines	CO3	Chalk & talk	T1
25	6 May 2022		Minimum cost spanning trees: Introduction	CO3	Chalk & talk	T1
26	7 May 2022		Prim's Algorithm, Problems on Prims algorithm	CO3	Chalk & talk	T1
27	9 May 2022		Kruskal's Algorithm, Problems on Kruskal's algorithm	CO3	Chalk & talk	T1
28	10 May 2022		Single source shortest paths: Huffman Trees and Codes	CO3	Chalk & talk	T1
29	13 May 2022		Dijkstra's Algorithm, Optimal Tree Problems	CO3	Chalk & talk	T1
30	14 May 2022		Transform and Conquer Approach: Heaps and Heap Sort	CO3	Chalk & talk	T1
31	16 May 2022		**MODULE -4:** Introduction to Dynamic Programming method.	CO4	PPT	T1
32	17 May 2022		General method with Examples	CO4	PPT	T2
33	20 May 2022		Multistage Graphs: Forward Approach	CO4	Chalk & talk	T2
34	21 May 2022		Multistage Graphs: Backward Approach	CO4	Chalk & talk	T1

35	22 May 2022		Transitive Closure: Warshall's Algorithm	CO4	Chalk & talk	T1
36	24 May 2022		All Pairs Shortest Paths: Floyd's Algorithm	CO4	Chalk & talk	T1
37	27 May 2022		Optimal Binary Search Trees, Problems	CO4	Chalk & talk	T1
38	28 May 2022		Knapsack problem, Problems	CO4	Chalk & talk	T1
39	30 May 2022		Bellman-Ford Algorithm, Problems	CO4	Chalk & talk	T1
40	31 May 2022		Travelling Sales Person problem	CO4	Chalk & talk	T1
41	6 Jun 2022		**MODULE -5:** Introduction, General method	CO5	PPT	T1
42	7 Jun 2022		N-Queens problem, 1,2,3,4, N queens Problem.	CO5	Chalk & talk	T2
43	10 Jun 2022		Sum of subsets problem	CO5	Chalk & talk	T2
44	11 Jun 2022		Graph coloring , Hamiltonian cycles	CO5	Chalk & talk	T1
45	13 Jun 2022		Introduction on Branch and Bound Technique.	CO5	PPT	T1
46	14 Jun 2022		Assignment Problem, LC Branch and Bound solution.	CO5	PPT	T1
47	17 Jun 2022		FIFO Branch and Bound solution	CO5	PPT	T1
48	18 Jun 2022		NP-Complete and NP- Hard problems:	CO5	PPT	T1
49	20 Jun 2022		Basic concepts, non-deterministic algorithms	CO5	PPT	T1
50	21 Jun 2022		P, NP, NP Complete and NP-Hard classes	CO5	PPT	T1

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T1	Introduction to the Design and Analysis of Algorithms, AnanyLevitin:2nd Edition, 2009(Pearson)
T2	Computer Algorithms/C++, Ellis Horowitz, SatrajSahni and Rajasekaran, 2nd Edition, 2014, Universities Press
R1	Introduction to Algorithms, Thomas H Cormen, Charles E Leiserson, Ronal L Rivest, Clifford Stein, 3rd Edition, PHI
R2	Design and Analysis of Algorithms , S Sridhar, Oxford (Higher Education)

Faculty Member **HOD**

Date: