SSN COLLEGE OF ENGINEERING, KALAVAKKAM
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Subject : Design and Analysis of Algorithms
Class : IV Sem
Sub. Code : UCS1403 Acad. Year: 2021-2022 (Even)
Staff Incharge : Dr. V. Balasubramanian / Dr. H. Shahul Hamead Batch : 2020-2024
LTPC : 3 0 0 3

LESSON PLAN

Content Delivery Methods (CDM) :

- Synchronous Lecture (S)
- Lab
- LMS

SNo	Topic	K level	CDM	No of Sessions		Deviations if any
				Proposed	Actual	
	UNIT – I Introduction and Analysis			9		
1.	Introduction and Motivation	K1	S	1		
2.	Overview of Algorithm Design Techniques	K2	S	1		
3.	Iterative Algorithms	K3	S	1		
4.	Recursive Algorithms	K3	S	1		
5.	Analysis of Algorithms I (Iterative)	K3	S	1		
6.	Analysis of Algorithms II (Recursive)	K3	S	2		
7.	Analysis of Algorithms III (Asymptotic)	K3	S	1		
8.	Algorithm Analysis Example	K3	S	1		

SNo	Topic	K level	CDM	No of Sessions		Deviations if any
				Proposed	Actual	
UNIT – II Brute Force and Divide and Conquer				**9**		
9.	Divide-and-conquer Recursion	K3	S	1		
10.	Divide-and-conquer: Mergesort	K3	S	2		
11.	Divide-and-conquer: Quicksort	K3	S	2		
12.	Divide-and-conquer: Multiplication of Large Integers	K3	S	1		
13.	Divide-and-conquer: Matrix Multiplication	K3	S	1		
14.	Brute Force: String Matching	K3	S	1		
15.	Brute Force: Closest-Pair	K3	S	1		

SNo	Topic	K level	CDM	No of Sessions		Deviations if any
				Proposed	Actual	

UNIT – III Dynamic Programming and Greedy Technique				9		
16.	Dynamic Programming: Introduction	K2	S	1		
17.	Dynamic Programming: Sequence	K4	S	2		
18.	Dynamic Programming: Subset Sum	K3	S	2		
19.	Dynamic Programming: Shortest Paths	K3	S	1		
20.	Greedy Algorithms: SSSP (Dijkstra)	K4	S	1		
21.	Greedy Algorithms: MST (Prim's)	K4	S	1		
22.	Greedy Algorithms: MST	K3	S	1		

SNo	Topic	K level	CDM	No of Sessions		Deviations if any
				Proposed	Actual	
UNIT – IV Iterative Improvement and Backtracking				9		
23.	Iterative Improvement	K2	S	1		
24.	Iterative Improvement: Bipartite Matching	K3	S	1		
25.	Iterative Improvement: Stable Matching	K4	S	1		
26.	Iterative Improvement: Network Flow	K3	S	2		
27.	State-space approach for problem solving	K3	S	1		
28.	Exhaustive Search — DFS & BFS	K3	S	1		
29.	Backtracking: n-Queens problem	K3	S	1		
30.	Backtracking: Hamiltonian Cycles	K3	S	1		

SNo	Topic	K level	CDM	No of Sessions		Deviations if any
				Proposed	Actual	
UNIT – V Limitations of Algorithm Power				9		
31.	Limitations: Algorithm Complexity Revisited	K3	S	1		
32.	Complexity classes	K4	S	1		
33.	Coping with the limitations	K3	S	1		
34.	Branch and Bound: Knapsack Problem	K4	S	2		
35.	Branch and Bound: Travelling Salesman Problem	K4	S	1		
36.	Approximation algorithms — Knapsack problem	K4	S	1		
37.	Approximation algorithms - Travelling Salesman Problem	K3	S	2		

Total Synchronous Lectures: 45

Lab Schedule:

Language/Tools/Packages: Linux, Python, Repl.it, LMS

S.No	Topic	Hours
1	Iterative and recursive algorithms	2
2	Decrease and conquer	2
3	Decrease and conquer	2
4	Divide and conquer	2
5	Divide and conquer	2
6	Dynamic Programming	2
7	Dynamic Programming	2
8	Greedy Technique	2
9	Greedy Technique	2
10	Iterative Improvement	2
11	Iterative Improvement	2
12	Exhaustive Search	2
13	Exhaustive Search	2

Prepared by	**Verified by**	**Approved by**
V. Balasubramanian H. Shahul Hamead	**UG-PAC team**	**HOD-CSE**

Description of Assessment Tools

Exams: Three Unit Assessment Tests during the term, assignments, and final University exams.

Course Assessment Matrix

Assessment Tools	**Course Outcomes**					**Weightage**
	CO1	CO2	CO3	CO4	CO5	
CAT 1 (Units 1, 2)	Y	Y	Y	Y		Best of 2 [2*15 = 30 Marks]
CAT 2 (Units 3)	Y	Y	Y	Y		
CAT 3 (Units 4,5)	Y	Y	Y	Y	Y	
Lab Assignment	Y	Y	Y	Y	Y	[1*10=10 Marks]
End Semester Examination	Y	Y	Y	Y	Y	60 Marks
Total						100 Marks