PVP SIDDHARTHA INSTITUTE OF TECHNOLOGY

LESSON PLAN
(PVPSIT/ACD/01)

ACADEMIC YEAR : **2023-24**
SUBJECT CODE & NAME : **Design and Analysis of Algorithms (20CS3403)**
YEAR & SEMESTER : **II B. Tech / II Semester / S1, S2, S3 / PVP20 Regulations**
FACULTY NAME : **Mr. E. Bala Bhasakar rao / Mr. L V Krishna rao**

CO#	COURSE OUTCOMES	LEVEL
CO1	Understand the fundamental concepts of algorithm analysis and design techniques.	L2
CO2	Apply various algorithm design techniques for solving problems	L3
CO3	Analyze the performance of different algorithms in divide and conquer.	L4
CO4	Analyze the feasible solutions to find optimal one for the given problem.	L4

Unit No	Topics of Syllabus to be covered	Learning outcomes	Teaching Mode	Hours Required (L)	Total Hours (Cumulative)	Expected date of completion (for each Unit) by HOD	Review /Remarks (by HOD)
I	**INTRODUCTION:** Notion of Algorithm	Understand definition and characteristics of algorithm, and conventions used for specification of algorithm.	BB / PPT	1	1		
I	Fundamentals of Algorithmic problem solving	Understand the algorithmic method for solving an problem	BB / PPT	1	2		
I	Analysis framework	Knowing the terms and assumptions like input size, computation model etc., for the analysis of an algorithm.	BB / PPT	1	3		

I	Performance analysis(a priori estimate)	Knowing how to find the running time of an algorithm using count or frequency method.	BB / PPT	1	4		
I	Asymptotic Notations	use asymptotic notations to represent the algorithm complexity	BB / PPT	1	5		
I	Basic Efficiency Classes	Standard notations to express complexity factor	BB / PPT	1	6		
I	Amortized Analysis	Knowing the methods for more precise analysis of an algorithm	flipclass	1	7		
I	Brute force Technique	Understanding brute force approach	BB / PPT	1	8		
I	Exhaustive Search	Understanding Exhaustive search Method	BB / PPT	1	9		
II	Divide and Conquer: Introduction	Understanding divide and conquer	BB / PPT	1	10		
II	Merge sort	how to perform merge sort and its performance	BB / PPT	1	11		
II	Quick sort	how to perform quick sort and its performance	BB / PPT	1	12		
II	Binary search	Performing the search operation	BB / PPT	1	13		
II	Finding minimum and maximum	Finding minimum and maximum of a given list	BB / PPT	1	14		
II	Strassen's Matrix Multiplication.	Multiplying two matrices	BB / PPT	2	16		
III	GREEDY TECHNIQUE: Introduction	Basics of greedy method	BB / PPT	1	17		
III	Huffman Trees and codes	Huffman trees construction and obtaining Huffman codes	BB / PPT	2	19		
III	Minimum Coin change problem	To find the min no .of coins required for given amount	BB / PPT	1	20		

III	knapsack problem	To find the valuable subset of items in a knapsack	BB / PPT	1	21		
III	Job sequencing with deadlines	to find job sequences gives maximum profit	BB / PPT	1	22		
III	Minimum Cost Spanning Trees	To find a minimal spanning tree	BB / PPT	2	24		
III	Single source shortest path	Single source shortest path problem	BB / PPT	1	25		
III	Greedy Method	Knowing the application of greedy method to solve problems	Group discussion	1	26		
IV	Dynamic Programming: Introduction	Understand the basic method of DP	BB / PPT	1	27		
IV	0/1 knapsack problem	To find the optimal subset of items in a knapsack	BB / PPT	2	29		
IV	All Pairs Shortest Paths	Finding all pairs shortest paths	BB / PPT	1	30		
IV	Optimal Binary Search Trees	Finding the optimal binary tree using dynamic programming	BB / PPT	2	32		
IV	Travelling Sales Person Problem	Finding optimal tour minimum cost	BB / PPT	2	34		
V	Back Tracking: Introduction	Basics of back tracking method	BB / PPT	1	35		
V	n- Queens problem	Solving queens problem	BB / PPT	1	36		
V	Sum of subsets	Finding the different subsets which gives the resultant value	BB / PPT	1	37		
V	Hamiltonian cycle	Finding the Hamiltonian cycle of a graph	BB / PPT	1	38		
V	Branch and Bound: Introduction	Basics of branch & bound method	BB / PPT	1	39		

V	Assignment Problem	Finding minimum cost assignment	BB / PPT	1	40		
V	Traveling Sales Person Problem	Finding minimum tour cost using B&B method	BB / PPT	1	41		
V	Introduction to complexity classes	Basics of Complex problem analysis	BB / PPT	1	42		
V	P and NP problems	Types of P and NP problems	BB / PPT	1	43		
V	NP – Complete Problems	What is NP-Completeness	BB / PPT	2	45		

Legend: Teaching mode   BB: Black Board   LCD: Power Point Presentation   L: Lecture Hours

Signature of Faculty   Signature of HOD

Date: