

**LESSON PLAN**  
**(PVPSIT/ACD/01)**

**Academic Year** : 2022 -2023  
**Year & Semester** : II B.Tech, II Semester, Section – I,II,III  
**Branch** : Computer Science & Engineering  
**Subject Code & Name** : 20CS3452, Design and Analysis of Algorithms Lab  
**Name of Faculty** : Mrs.V.Swathi, Mr.L.V.Krishna Rao, Mr.E.Bala Bhaskar

CO	Statement	Skill	Levels
CO1	Apply different algorithm design techniques for solving problems.	Apply	L3
CO2	Implement various experiments as an individual or team member	Individual Performance, Self-Learning	L3
CO3	Develop an effective report based on various programs implemented	Communication	L3
CO4	Apply technical knowledge for a given problem and express with an effective oral communication	Apply, Communication	L3
CO5	Analyze outputs generated using C++ programming	Analyze	L4

S.No	Experiment Name	Hours Required	Total number of hours required	Expected date of completion (for each unit) by HOD	Review / Remarks (by HOD)
1	Develop and implement an algorithm using Divide and Conquer strategy for a given set of problems. <ul style="list-style-type: none"> <li>• Sorting – (quick sort, merge sort)</li> <li>• Binary Search</li> </ul> 1. <a href="https://leetcode.com/problems/partition-array-according-to-given-pivot/">https://leetcode.com/problems/partition-array-according-to-given-pivot/</a> 2. <a href="https://leetcode.com/problems/kth-largest-element-in-an-array/">https://leetcode.com/problems/kth-largest-element-in-an-array/</a>	3	3		

2	Develop and implement an algorithm using Divide and Conquer strategy for a given set of problems. <ul style="list-style-type: none"> <li>Finding minimum and maximum</li> <li>3. <a href="https://leetcode.com/problems/removing-minimum-and-maximum-from-array/">https://leetcode.com/problems/removing-minimum-and-maximum-from-array/</a></li> <li>4. <a href="https://leetcode.com/problems/divide-array-into-equal-pairs/">https://leetcode.com/problems/divide-array-into-equal-pairs/</a></li> </ul>	3	6		
3	Develop and implement an algorithm using Divide and Conquer strategy for a given set of problems. <ul style="list-style-type: none"> <li>Strassen's Matrix Multiplication</li> <li>Closest pair problem</li> <li>5. <a href="https://leetcode.com/problems/coin-change/">https://leetcode.com/problems/coin-change/</a></li> </ul>	3	9		
4	Make use of Greedy method to implement a solution for a given problem. <ul style="list-style-type: none"> <li>Huffman coding</li> <li>Knapsack problem</li> <li>1. <a href="https://www.hackerrank.com/challenges/minimum-absolute-difference-in-anarray/problem?isFullScreen=true">https://www.hackerrank.com/challenges/minimum-absolute-difference-in-anarray/problem?isFullScreen=true</a></li> </ul>	3	12		
5	Make use of Greedy method to implement a solution for a given problem. <ul style="list-style-type: none"> <li>Minimum coin change</li> <li>Job sequencing with deadlines</li> <li>2. <a href="https://www.hackerrank.com/challenges/marcs-cakewalk/problem?isFullScreen=true">https://www.hackerrank.com/challenges/marcs-cakewalk/problem?isFullScreen=true</a></li> <li>3. <a href="https://www.hackerrank.com/challenges/grid-challenge/problem?isFullScreen=true">https://www.hackerrank.com/challenges/grid-challenge/problem?isFullScreen=true</a></li> </ul>	3	15		
6	Make use of Greedy method to implement a solution for a given problem. <ul style="list-style-type: none"> <li>Minimum cost spanning trees</li> <li>Single source shortest paths</li> <li>4. <a href="https://leetcode.com/problems/largest-number/">https://leetcode.com/problems/largest-number/</a></li> <li>5. <a href="https://leetcode.com/problems/array-partition/">https://leetcode.com/problems/array-partition/</a></li> </ul>	3	18		
7	Develop and implement an efficient solution using Dynamic Programming. <ul style="list-style-type: none"> <li>0/1 knapsack problem</li> <li>All pairs shortest paths problem</li> </ul>	3	21		

8	Develop and implement an efficient solution using Dynamic Programming. <ul style="list-style-type: none"> <li>Optimal Binary search trees</li> <li>Travelling salesmen problem</li> </ul>	3	24		
9	Problems from coding platforms on Dynamic Programming <ol style="list-style-type: none"> <li><a href="https://www.codechef.com/problems/SUMTRIAN">https://www.codechef.com/problems/SUMTRIAN</a></li> <li><a href="https://www.codechef.com/problems/COINS">https://www.codechef.com/problems/COINS</a></li> <li><a href="https://www.hackerrank.com/challenges/unique-divide-and-conquer/problem">https://www.hackerrank.com/challenges/unique-divide-and-conquer/problem</a></li> <li><a href="https://leetcode.com/problems/maximum-subarray/">https://leetcode.com/problems/maximum-subarray/</a></li> <li><a href="https://leetcode.com/problems/unique-binary-search-trees-ii">https://leetcode.com/problems/unique-binary-search-trees-ii</a></li> </ol>	3	27		
10	Use Backtracking design technique to implement a solution for a given problem. <ul style="list-style-type: none"> <li>N -queens</li> <li>Sum of subsets</li> </ul>	3	30		
11	Use Backtracking design technique to implement a solution for a given problem. <ul style="list-style-type: none"> <li>Hamiltonian cycle.</li> </ul> <ol style="list-style-type: none"> <li><a href="https://leetcode.com/problems/count-numbers-with-unique-digits/">https://leetcode.com/problems/count-numbers-with-unique-digits/</a></li> </ol>	3	33		
12	Develop and implement an algorithm using Branch and Bound technique for solving a given problem. <ul style="list-style-type: none"> <li>Assignment problem</li> <li>Travelling salesmen problem</li> </ul>	3	39		
13	Internal Assessment	3	42		

Signature of the Faculty

Signature of the HOD