



BR23-CSE II YEAR I SEMESTER SYLLABUS

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II Year I Semester

**ADVANCED DATA STRUCTURES & ALGORITHM ANALYSIS LAB
(23CS3L02)**

(Common to CSE, IT, CSE-(AI & DS), AI & ML branches)

Course Objectives:

The objectives of the course is to





- acquire practical skills in constructing and managing Data structures
- apply the popular algorithm design methods in problem-solving scenarios

Course Outcomes:

- At the end of the course students can be able to ,
- Apply practical skills in constructing and managing advanced data structures (Apply).
- Analyze the performance of sorting algorithms through various input sizes (Analyze).
- Apply greedy and dynamic programming design methods in problem solving scenarios (Apply).
- Practice backtracking, branch-and-bound design methods in real-world problems (Apply).

Experiments covering the Topics:

- Operations on AVL trees, B-Trees, Heap Trees
- Graph Traversals
- Sorting techniques
- Minimum cost spanning trees
- Shortest path algorithms
- 0/1 Knapsack Problem
- Travelling Salesperson problem

					
Dr.N.Rama Krishnaiah, Professor of CSE,UCEK & Control of Examination JNTUK, kakinada.	Dr.C.Krishna Mohan, Professor of CSE,IIT, Kandi, Hyderabad.	Dr.P.Radha Krishna, Professor of CSE,NIT, Warangal	Mr.Rajesh Bobburi Chief Operating Officer, HighQ Labs Private Limited, Rajahmundry	Dr.Lakshmi Haritha Medida, Associate Professor, R.M.K.Engineering College,Kavaraipettai ,Tamilnadu	Dr.K.Sriniva Professor & HoD Department CSE, B.V.C.I.T.S. Batlapalem



BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
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 AFFILIATED TO JNTUK-KAKINADA, ACCREDITED BY NAAC 'A' GRADE,
 2 PROGRAMMES (CSE,EEE) ACCREDITED BY NBA (For A.Y 2023-24 to 2025-26)
 Post Box: 26, Amalapuram 533201, Dr.B R Ambedkar Konaseema Dt., A.P.

- Optimal Binary Search Trees
- N-Queens Problem
- Job Sequencing

Sample Programs:

1. Construct an AVL tree for a given set of elements which are stored in a file. And implement insert and delete operation on the constructed tree. Write contents of tree into a new file using in-order.
2. Construct B-Tree an order of 5 with a set of 100 random elements stored in array. Implement searching, insertion and deletion operations.
3. Construct Min and Max Heap using arrays, delete any element and display the content of the Heap.
4. Implement BFT and DFT for given graph, when graph is represented by
 a) Adjacency Matrix b) Adjacency Lists
5. Write a program for finding the biconnected components in a given graph.
6. Implement Quick sort and Merge sort and observe the execution time for various input sizes (Average, Worst and Best cases).
7. Compare the performance of Single Source Shortest Paths using Greedy method when the graph is represented by adjacency matrix and adjacency lists.
8. Implement Job Sequencing with deadlines using Greedy strategy.
9. Write a program to solve 0/1 Knapsack problem Using Dynamic Programming.
10. Implement N-Queens Problem Using Backtracking.
11. Use Backtracking strategy to solve 0/1 Knapsack problem.
12. Implement Travelling Sales Person problem using Branch and Bound approach.

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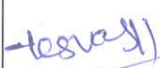
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Reference Books:

1. Fundamentals of Data Structures in C++, Horowitz Ellis, SahniSartaj, Mehta, Dinesh, 2ndEdition, Universities Press
2. Computer Algorithms/C++ Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, 2ndEdition, University Press
3. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
4. An introduction to Data Structures with applications, Trembley& Sorenson, McGrawHill

Online Learning Resources:

1. <http://cse01-iiith.vlabs.ac.in/>
2. <http://peterindia.net/Algorithms.html>
3. <https://ds1-iiith.vlabs.ac.in/>
4. <https://ds2-iiith.vlabs.ac.in/>

					
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