PRANVEER SINGH INSTITUTE OF TECHNOLOGY, KANPUR

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Odd Semester 2023-24

B. Tech.- Third Year

Semester- V

Lab File

Design and Analysis of Algorithm

(KCS553)

Submitted To :

Faculty Name :_____

Designation :_____

Submitted By :

Name :_____

Roll No. :_____

Section :_____

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Department Vision Statement

To be a recognized Department of Computer Science & Engineering that produces versatile computer engineers, capable of adapting to the changing needs of computer and related industry.

Department Mission Statements

The mission of the Department of Computer Science and Engineering is:

i. To provide broad based quality education with knowledge and attitude to succeed in Computer Science & Engineering careers.

ii. To prepare students for emerging trends in computer and related industry.

iii. To develop competence in students by providing them skills and aptitude to foster culture of continuous and lifelong learning.

iv. To develop practicing engineers who investigate research, design, and find workable solutions to complex engineering problems with awareness & concern for society as well as environment.

Program Educational Objectives (PEOs)

i. The graduates will be efficient leading professionals with knowledge of computer science & engineering discipline that enables them to pursue higher education and/or successful careers in various domains.

ii. Graduates will possess capability of designing successful innovative solutions to real life problems that are technically sound, economically viable and socially acceptable.

iii. Graduates will be competent team leaders, effective communicators and capable of working in multidisciplinary teams following ethical values.

iv. The graduates will be capable of adapting to new technologies/tools and constantly upgrading their knowledge and skills with an attitude for lifelong learning

Department Program Outcomes (POs)

The students of Computer Science and Engineering Department will be able:

1. Engineering knowledge: Apply the knowledge of mathematics, science, Computer Science & Engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and Computer Science & Engineering sciences.

3. Design/development of solutions: Design solutions for complex Computer Science & Engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Investigation: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex Computer Science & Engineering activities with an understanding of the limitations.

6. The Engineering and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice in the field of Computer Science and Engineering.

7. Environment and sustainability: Understand the impact of the professional Computer Science & Engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the Computer Science & Engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex Computer Science & Engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the Computer Science & Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Department Program Specific Outcomes (PSOs)

The students will be able to:

1. Use algorithms, data structures/management, software design, concepts of programming languages and computer organization and architecture.

2. Understand the processes that support the delivery and management of information systems within a specific application environment.

Course Outcomes

*Level of Bloom's Taxonomy	Level to be met	*Level of Bloom's Taxonomy	Level to be met
L1: Remember	1	L2: Understand	2
L3: Apply	3	L4: Analyze	4
L5: Evaluate	5	L6: Create	6

CO Number	Course Outcomes
KCS-553.1	Apply [L3:Application] an Algorithm to solve a computational problem.
KCS-553.2	Analyze [L4:Analysis] an Algorithm to solve a computational problem.

List of Experiments

Lab No.	Lab Experiment	Corresponding CO
1	Implementation and Analysis of Linear Search Using recursive function	CO2
	Implementation and Analysis of Binary Search Using recursive function	
2	Implementation and Analysis of Insertion Sort .	CO2
	Implementation and Analysis of Bubble Sort.	
	Implementation and Analysis of Selection Sort.	
3	Implementation and Analysis of Merge Sort.	CO2
	Implementation and Analysis of Quick Sort.	
4	Implementation and Analysis of Heap Sort.	CO2
	Implementation and Analysis of Counting Sort.	
5	Implementation and Analysis of Radix Sort.	CO2
	Implementation of Shell Sort.	CO2
6	Implementation of Activity Selection Problem	CO1
	Implementation of Knapsack Problem using Greedy Solution	
7	Implement and Analysis of the 0/1 Knapsack problem using Dynamic Programming method	CO2
	Implementation and Analysis of LCS	
8	Implementation of Kruskal's algorithm to find MST.	CO1
	Implementation of Prim's algorithm to find MST.	
9	Implementation of Warshal's Algorithm for All Pair Shortest Path.	CO1
	Implementation of Dijkstra Algorithm for Single Source Shortest Path.	
10	Implementation of N Queen Problem using Backtracking	CO1
	Implementation of Sum of Subset problem using Backtracking	
11	Implementation of Naïve String-matching algorithm	CO1
	Implementation of Rabin Karp String matching algorithm	
12	Implement to find all Hamiltonian Cycles in a connected undirected Graph G of n vertices using backtracking	CO1
13	Implementation of insertion operation in RB Tree	CO1
14	Implementation of insertion operation in B Tree	CO1

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S No	Lab Experiment	Date of Experiment	Date of Submission	Marks	Faculty Signature
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2					
3					
4					
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6					
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