Computer System and Algorithm Programming Course

Course Duration : 40 Hours **Course code : CSAP-937**

1. Course Overview

The Computer System and Algorithm Programming Course is designed to provide a strong foundation in computer systems and algorithmic problem-solving. This course focuses on understanding how computer systems work internally and how efficient algorithms are designed to solve complex computational problems.

2. What you'll learn?

- Fundamentals of computer systems
- Data structures and algorithms
- Time and space complexity analysis
- Memory management concepts
- Problem-solving and coding techniques
- Optimization strategies

3. Target Audience

- Computer science students
- Software developers and programmers
- Competitive programming enthusiasts
- IT professionals
- Beginners interested in algorithms

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4. Pre-Requisites

- Basic knowledge of programming (C/C++/Java/Python)
- Understanding of basic mathematics
- Interest in problem-solving and coding
- Familiarity with computers

5. Course Content (Modules)

Module 1: Computer System Fundamentals

- Basics of computer architecture
- CPU, memory, and storage
- Operating system overview

Module 2: Data Structures

- Arrays, linked lists, stacks, queues
- Trees and graphs
- Implementation techniques

Module 3: Algorithm Design Techniques

- Sorting and searching algorithms
- Recursion and divide & conquer
- Greedy and dynamic programming

Module 4: Complexity & Optimization

- Time and space complexity
- Big-O notation
- Code optimization strategies

Module 5: Practical Programming & Problem Solving

- Real-world coding problems
- Competitive programming basics