In the name of ALLAH

Coding Interview Course (BD Big Tech and FAANG)

A Complete Guideline for Your Software Engineering Job Interview

80+ Live Classes, **20+** Industry Specific Classes, **400+** Leetcode Problems,
Course Duration: **6 Months**, **Weekly 3 Classes**.
Course Fee: **6000/-**

Course Features:

1. 👩‍🏫 **80+ Live Classes:** Covering all essential topics comprehensively.
2. 🎯 **20+ Industry-Specific Guideline Classes:** Get insights from industry Engineers.
3. 🧩 **400+ Handpicked LeetCode Problems:** Focused on top interview patterns and FAANG questions.
4. 📽️ **Videos of Each Class:** Access recordings for revision anytime.
5. 🎥 **Solution Videos for All 400+ Problems:** Master problem-solving with detailed explanations.
6. 📝 **MCQ Tests for Each Topic:** Validate your understanding and track progress.
7. 🤝 **Mock Interviews:** Top students will conduct interviews with each other to simulate real-world scenarios.
8. 📄 **CV Reviews and Soft Skills Development:** Build a professional resume and refine interpersonal skills.
9. **Weekly 3 Classes** (2 Coding Classes, 1 CSE Fundamental)

What Makes This Course Unique?

The **400 handpicked LeetCode problems** are the most valuable part of this course! These problems cover:

- 🚀 **Top Interview Problems of FAANG** (Meta, Amazon, Apple, Netflix, Google).

- 🔍 **Frequently Asked FAANG Questions** to help you prepare smartly.
- 📘 **Cracking the Coding Interview Problems** aligned with industry standards.
- 💡 **The 23 Problem Patterns of Coding Interviews**, ensuring you master the most recurring patterns.

Who Can Join?

- 🎓 **Final-Year Students:** Preparing for their first job or career shift.
- 💼 **Job Seekers:** Looking to crack interviews and secure roles in top companies.
- 🚀 **Working Professionals:** Aspiring to join BD Big Tech or FAANG.

Pre-requisite:

- ✅ Must have a basic understanding of **C++** programming.

Coding Interview Preparation

Core Foundations:

Complexity Analysis, Time and space complexity basics, Big-O notation, **Array**, **Vector**, Array simulations, rotations, and manipulations, **Matrix Operations**, 2D matrix simulations and transformations.

Strings and Patterns:

String, String Manipulations, Simulation, Reverse, Parsing, **Palindrome and Anagrams**, string rotation, char count

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Data Structures with STL:

Map, Set, Stack, Queue, Deque, Priority Queue (Min-Heap, Max-Heap), LRU Cache, Circular Queue, Custom Comparators in Priority Queues.

Mathematical and Bit Manipulation Techniques:

Bit Manipulation, Efficient binary operations for problem-solving, **Mathematical Foundations**, Number theory, modular arithmetic, and digit manipulations, Bit masking, XOR operator and its magics.

Greedy Algorithms:

Solving optimization problems with local decisions.

Recursion and Backtracking:

Problem-solving using recursion and exploring all possibilities, N-Queens problem, Subsets, Permutations, Generate Parenthesis, Fibonacci sequence.

Sorting:

Sorting Algorithms, Bubble, Merge, Quick, and Insertion Sor, Difference between Merge Sort and Quick Sort, Counting Sort, Heap Sort

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Searching:

Binary Search Variations, Lower/Upper bounds, Bisection.

Two Pointers and Sliding Windows:

Two pointers and sliding windows

Linked Lists:

Singly, Doubly, and Circular Linked Lists, Reverse, Rotate, Merge, and Detect Loops, Reverse a Linked List, Detect and Removing Loops in a Linked List, merge two Linked Lists, Find the Middle Element of a Linked List, Intersection of Two Linked Lists, Clone a Linked List with Random Pointers, Rotate a Linked List, Add Two Numbers Represented by Linked Lists

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Graphs and Trees:

DFS, BFS, Topological Sort, Cycle Detection, Island, Dijkstra, Bellman-Ford, Floyd-Warshall.

Binary Tree and Binary Search Tree:

Binary Search Trees, Balanced Trees, Heap Sort, Balanced binary search tree, Tree Construction from Traversals, Lowest Common Ancestor (LCA), Tree Diameter, Tree Balancing Techniques, Depth-First Search (DFS) and Breadth-First Search (BFS), Maximum Path Sum, Introduction to Heap, Types of Heaps (Min-Heap, Max-Heap), Heap Operations (Insert, Extract, Peek), Heap Applications (Priority Queues, Heap Sort), Introduction to Binary Search Tree (BST), BST Operations (Insertion, Deletion, Search), Tree Traversal (In-order, Pre-order, Post-order)

Dynamic Programming:

0-1 Knapsack, Coin Change, Longest Increasing Subsequence (LIS), Longest Common Subsequence (LCS). Longest Palindromic Substring (Manachers algorithm)

Advanced-Data Structures:

Trie: Insert, Search, and Applications (Autocomplete, Spell Checker), **Segment Trees**: Range queries and updates, KMP string algorithm

CSE Fundamentals

Object-Oriented Programming (OOP) Using C#:

1. **Fundamentals**:
    - Classes and Objects
    - Encapsulation, Inheritance, Polymorphism, and Abstraction
2. **Advanced Topics**:
    - Constructor and Destructor
    - Method Overloading and Overriding
    - Abstract Classes and Interfaces
    - What is runtime and compile time polymorphism

Practical Exercises

- Hotel Booking System
- Parking Lot
- Chat Server

Database Management System (DBMS):

- **Basics**:
    - SELECT, INSERT, UPDATE, DELETE.
    - WHERE, GROUP BY, HAVING, and ORDER BY.
- **Intermediate Concepts**:
    - Joins: INNER, LEFT, RIGHT, FULL OUTER JOIN.
- **Advanced Topics**:
    - ACID Properties.

Design Principles:

1. **Basics**:
    a. DRY, KISS, YAGNI
2. **Intermediate Concepts**:
    a. SOLID Principles

System Design:

Core Concepts

1. **Basic Components**:
    - Load Balancers, Caching, Proxies, and Databases.
    - Horizontal and Vertical Scaling.
2. **Key Topics**:
    - Designing Scalable Systems: Consistency, Availability, and Partition Tolerance (CAP Theorem).
    - Microservices vs. Monoliths.
    - Distributed Systems and Databases.

Case Studies and Practical Exercises

- Design a **URL Shortener System** (e.g., TinyURL).
- Create a **Messaging System** (e.g., WhatsApp).
- Design **Instagram's Newsfeed System**.

Operating Systems (OS):

Core Concepts

1. **Basics**:
    - Process vs. Thread.
    - CPU Scheduling Algorithms: FCFS, SJF, Round Robin, Priority Scheduling.
    - Memory Management: Paging, Segmentation, Virtual Memory.
2. **Intermediate Concepts**:

    - Synchronization: Mutex, Semaphore, Deadlock Avoidance (Banker's Algorithm).
    - File Systems and Disk Scheduling.
    - Interprocess Communication (IPC).

Practical Exercises

- Implement a simple **Multithreading Program** in C++/Java.
- Solve deadlock problems (e.g., detect or avoid deadlocks).