

# **CS Fundamentals: List of Important Topics**

**Target : Placement/Internship Interviews**

For any doubt or preparation guide, [Ping here](#) 

## **Object-Oriented Programming:**

- Objects
- Classes
- Polymorphism
- Abstraction
- Encapsulation
- Inheritance
- Exception Handling
- Object-Oriented Design
- MISC (Friend & Virtual - Functions, Ctor, Dtor)

## **Database Management System:**

- Introduction (Architecture, User Cases)
- Entity-Relationship Model (ERD Diagrams)
- Relational Model (Schema Design, Keys, Anomalies)
- Relational Algebra (Joins, Operators)
- Normalisation (Meaning & its forms 1NF, 2NF)
- Transactions and Concurrency Control (ACID Properties )
- Indexing, B and B+ trees (File Structure)
- SQL Queries

## Operating System:

- **Basic Concepts** (Work & Types)
- **System Structure** (Kernel, I/O System)
- **CPU Scheduling** (FCFS, SJF, Round Robin, PS)
- **Process Synchronization** (Producer-Consumer, Read-Write, Semaphores, IC)
- **Deadlock** (Necessary Conditions, Algos)
- **Processes & Threads** (Thread types, Multi-threading)
- **Memory Management** (Paging, Virtual Memory)
- **File and Disk Management** (FIFO, File Allocation)

## Computer Networks:

- **OSI Model** (Open Systems Interconnection Architecture)
- **Application Layer** (HTTP, SMTP, FTP)
- **Network Layer** (IPv4, IPv6, Routing)
- **Transport Layer** (TCP/UDP Protocol, Congestion Policies)
- **Datalink Layer** (Ethernet, Error & Flow Control Policies)

## Software Engineering Concepts:

- **Introduction** (Types of Software)
- **Software Development Life Cycle (SDLC Models)**

## System Design:

- **System Design Concepts**
- **System Design Interview Problems**

## **Resource Guide** ⚡🚀

Object-Oriented Programming:

Book: [Link](#)

Video: [C++ Playlist](#) [OOps in Java](#)

Written: [In C++](#) [In Java](#)

[Practice](#)

Operating System:

Video: [Playlist 1](#) [Playlist 2](#) [Playlist 3](#)

[Written](#)

[Practice](#)

Database Management System:

Video: [Playlist 1](#) [Playlist 2](#)

[Written](#)

[Practice](#)

Software Engineering Concepts:

Video: [Playlist](#)

[Written](#)

[Practice](#)

Computer Networks:

Video: [Playlist 1](#), [Playlist 2](#)

[Written](#)  
[Practice](#)

System Design:

Video: [Playlist](#)

Written: Available [here](#)