Java Full Syllabus and Course Overview

Importance of Java in Real Life and Industry

Java is one of the most widely used programming languages in the world, with applications in enterprise systems, web development, Android app development, and more. Its platform independence, object-oriented nature, and rich set of APIs make it a preferred choice for building large-scale, robust, and high-performance applications. Java's versatility allows developers to build secure, scalable applications used across various industries, including banking, healthcare, e-commerce, and education.

1. Introduction to Java

- History and Features of Java
- Java Development Kit (JDK)
- Java Runtime Environment (JRE)
- Writing Your First Java Program

2. Object-Oriented Programming (OOP) Concepts

- Classes and Objects
- Inheritance
- Polymorphism
- Encapsulation
- Abstraction
- Interfaces and Abstract Classes

3. Data Types, Variables, and Operators

- Primitive Data Types
- Reference Data Types
- Type Casting
- Arithmetic, Logical, and Relational Operators

4. Control Flow Statements

- Conditional Statements (if, else, switch)
- Loops (for, while, do-while)
- Break and Continue Statements

5. Exception Handling

- Try, Catch, Finally Blocks
- Throwing Exceptions
- Creating Custom Exceptions
- Exception Propagation

6. Java Collections Framework

- List, Set, and Map Interfaces
- ArrayList, LinkedList, HashSet, TreeSet, HashMap
- Iterator and Enhanced For Loop
- Comparable and Comparator

7. File Handling in Java

- Reading and Writing Files
- BufferedReader and BufferedWriter
- FileInputStream and FileOutputStream
- Serialization and Deserialization

8. Multithreading and Concurrency

- Creating Threads by Extending Thread Class
- Implementing Runnable Interface
- Thread Lifecycle
- Synchronization
- Executor Framework

9. Java Database Connectivity (JDBC)

- Introduction to JDBC
- Connecting to Databases
- Executing SQL Queries in Java
- PreparedStatement and CallableStatement
- Transaction Management in JDBC

10. Introduction to Java Frameworks

- Overview of Spring Framework
- Introduction to Hibernate
- JavaFX for GUI Development
- Introduction to Maven and Gradle for Project Management