

# 4-Week Java Course Syllabus



## Week 1: Introduction to Java Programming

### Day 1: Overview of Java

- Introduction to Java and its features
- Setting up the development environment (JDK, IDE, etc.)
- Writing and running your first Java program
- Basic syntax: variables, data types, and operators

### Day 2: Control Structures

- Conditional statements (if, else if, switch)
- Loops (for, while, do-while)
- Nested loops and conditional logic

### Day 3: Arrays and Strings

- Introduction to arrays (single and multidimensional)
- Basic string handling and operations
- String manipulation (substring, replace, split)

### Day 4: Functions and Methods

- Defining and calling functions/methods
- Method overloading and return types
- Scope of variables and parameter passing

## Week 2: Object-Oriented Programming (OOP)

### Day 5: Introduction to OOP Concepts

- Classes and objects
- Constructors and destructors
- Access modifiers (public, private, protected)

### Day 6: Inheritance and Polymorphism

- Inheritance: extending classes
- Method overriding
- Polymorphism: dynamic method dispatch

#### Day 7: Encapsulation and Abstraction

- Encapsulation: getters and setters
- Abstraction: abstract classes and interfaces
- Packages and access control

#### Day 8: Static Members and Inner Classes

- Static variables, methods, and blocks
- Inner and anonymous classes
- Understanding 'this' and 'super' keywords

### **Week 3: Advanced Java Concepts**

Day 9: Exception Handling - Introduction to exceptions and error handling - Try-catch block, multiple catches, finally - Custom exceptions

Day 10: File Handling - File I/O: reading and writing files - Serialization and Deserialization - Working with binary and text files

Day 11: Collections Framework - Introduction to collections: List, Set, Map - ArrayList, LinkedList, HashSet, HashMap - Iterators and enhanced for loop

Day 12: Multithreading - Understanding threads and the Runnable interface



- Thread lifecycle and states
- Synchronization and inter-thread communication



## **Week 4: Java Development & Best Practices**

Day 13: JDBC and Database Connectivity

- Introduction to JDBC
- Connecting to a database, executing queries
- CRUD operations using JDBC

Day 14: GUI Programming with Swing

- Introduction to GUI development in Java
- Basic Swing components: JFrame, JButton, JLabel
- Event handling and listeners

Day 15: Java Development Tools

- Introduction to Maven and Gradle
- Building and managing Java projects
- Unit testing with JUnit

Day 16: Best Practices and Final Project

- Code optimization and best practices
- Refactoring and clean code principles
- Final project presentation and review

## **Project and Assessment**

Project:

Throughout the course, students will work on a simple project that incorporates the various concepts learned, such as a console-based application or a basic GUI application using Swing.

Assessment:

- Weekly quizzes to reinforce learning.
- Final project presentation and code review.