

# Advanced Java Course Outline (Approx. 35 Lectures × 45 min)

## Core Java Refresher & OOP Concepts (Lectures 1-7)

- Lecture 1-2: Java Environment Setup, Variables, Data Types, Operators
- Lecture 3-4: OOP Concepts – Classes, Objects, Inheritance, Polymorphism, Abstraction, Encapsulation
- Lecture 5: Exception Handling (Try-catch-finally, Custom Exceptions)
- Lecture 6: Collections Framework – List, Set, Map, Queue, Iterator
- Lecture 7: Java 8+ Features – Lambda Expressions, Streams API, Functional Interfaces

## Multithreading & Concurrency (Lectures 8-10)

- Lecture 8: Threads, Runnable Interface, Thread Life Cycle
- Lecture 9: Synchronization, Locks, Deadlocks
- Lecture 10: Concurrent Utilities (ExecutorService, BlockingQueue, Semaphore)

## JDBC & Database Connectivity (Lectures 11-13)

- Lecture 11: JDBC Architecture, Connections, Statement, PreparedStatement
- Lecture 12: Transactions, Batch Processing
- Lecture 13: ResultSet and Metadata Handling

## Servlets & JSP (Lectures 14-17)

- Lecture 14: Introduction to Servlets, Life Cycle, HTTP Methods
- Lecture 15: Session Management (Cookies, HttpSession)
- Lecture 16: JSP Syntax, Directives, Expressions, Scriptlets
- Lecture 17: JSTL and EL, MVC Architecture with Servlets and JSP

## Frameworks Introduction (Lectures 18-22)

- Lecture 18: Basics of Spring Framework, Dependency Injection
- Lecture 19: Spring Boot Setup and Annotations
- Lecture 20: Hibernate ORM – Configuration, Mapping, CRUD Operations
- Lecture 21: RESTful Web Services using Spring MVC
- Lecture 22: Spring Security Basics

## Design Patterns & Best Practices (Lectures 23-25)

- Lecture 23: Common Design Patterns – Singleton, Factory, Observer, Decorator

- Lecture 24: SOLID Principles, Clean Code Concepts
- Lecture 25: Unit Testing with JUnit and Mockito

## **Advanced Java Topics (Lectures 26-29)**

- Lecture 26: Java Messaging Service (JMS) Basics
- Lecture 27: Java Authentication and Authorization Service (JAAS)
- Lecture 28: Microservices Architecture with Spring Cloud
- Lecture 29: Docker and Kubernetes Basics for Java Apps

## **Project & Deployment (Lectures 30-35)**

- Lecture 30: Building a Full-Stack Java Project (Servlets, JSP, Spring, Hibernate)
- Lecture 31: Application Deployment (Tomcat, AWS, Azure)
- Lecture 32: Debugging and Performance Tuning
- Lecture 33: Monitoring and Logging (Log4j, SLF4J)
- Lecture 34: Code Review and Best Development Practices
- Lecture 35: Interview Preparation & Real-world Scenarios

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