

# JAVA

## Backend Development Live



Detailed  
Course Syllabus

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## Week 01

### Session 01 **Java OOPS Fundamentals**

- Understand the fundamentals of Java OOPS concepts like Object, Class, Inheritance, Polymorphism, Abstraction, and Encapsulation
- Learn how to handle exceptions in Java
- Master the Singleton Design Pattern

### Session 02 **Java 8 Functional Interfaces & Collections**

- Learn the differences between Abstract Classes and Interfaces with practical examples
- Explore Functional Interfaces, Lambda Expressions
- Use Generics and Streams to write efficient code
- Work with Java Collections for efficient data management

## Week 02

### Session 03 **Multithreading & HashMap**

- Delve into the workings of HashMap
- Understand the concepts of Multithreading, such as Thread creation, Thread Groups, and Thread Join
- Learn to differentiate between Sequential and Parallel Streams for effective task execution

### Session 04 **Maven for Project Management**

- Understand the need for Maven
- Learn to work with POM.xml, explore different Maven Repositories and their types
- Understand the Maven Lifecycle for efficient project management

## Week 03

### Session 05 **Spring Boot Basics**

- Learn the basics of Server and Client models
- Introduction to Spring Boot
- How to run application as a Server
- Understand Embedded Servers like Jetty and Tomcat
- Manage Logging Levels in Spring Boot
- Work with Spring profiles and terminal commands

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## Session 06 **REST API & Spring MVC**

- Gain knowledge about REST API, HTTP Requests and Responses
- learn to work with POSTMAN and CURL for API testing
- Understand Annotations and Lombok
- Explore the Spring MVC framework

## Week 04

## Session 07 **Spring IOC & Dependency Injection**

- Learn about the Spring IOC container, Dependency Injection, and Enums
- Understand the target of an Annotation
- Configure Beans using @Configuration and @Bean annotations

## Session 08 **Java Database Connectivity (JDBC)**

- Understand the differences between In-Memory and Disk Storage
- Learn to connect a Spring Boot application with a Database Server
- Create Request Classes
- Perform validations using JDBC

## Week 05

## Session 09 **JPA & Hibernate**

- Understand the need for an abstraction layer between DAO and Database
- Learn about JPA (Java Persistence API), Hibernate, Entity Classes, Annotations, JPA Repository, and ResponseEntity

## Session 10 **JPQL & Minor Project - Digital Library**

- Explore custom queries using JPQL (Java Persistence Query Language)
- Learn about relationships in JPA
- Work on a **Digital Library [Minor Project]**
- Create a project flowchart

## Week 06

## Session 11 **Digital Library [Minor Project] (Continued)**

- Continue working on the **Digital Library [Minor Project]**
- Understand project HLSD
- Data Modelling concepts

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## Session 12 **Unit Testing with JUnit & Mockito**

- Learn to change the path of the local repository (.m2)
- Parse CSV files with Spring Boot
- Understand the importance of Unit Testing with JUnit and Mockito

### Week 07

## Session 13 **Redis & Caching**

- Get introduced to Redis
- Learn the differences between Cache and Cookie
- Understand Server Cache vs Browser Cache
- Work with Local Redis Server
- Online Centralized Redis Server for efficient caching

## Session 14 **Spring Security & Authentication**

- Learn about Spring Security and its terminologies
- Perform Basic Authentication using System Generated Credentials
- Understand Authorization with In-Memory
- Database user Authentication

### Week 08

## Session 15 **Digital Library [Minor Project] (Continued)**

- Improvement and feature addition for Digital Library [Minor Project]
- Gain insights into project overview, project HLSD, and project Data Modelling

## Session 16 **OAuth 2 & Github Integration**

- Introduction to OAuth2
- OAuth 2.0 concepts
- Learn the workflow of OAuth 2.0
- Explore Scopes and Consent
- Implement Github OAuth2 integration with Spring Boot

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## Week 09

### Session 17 Kafka Message Queue Introduction

- Learn about Message Queues and their types
- Types of Message Queues
- Get introduced to Kafka Message Queue for efficient messaging systems

### Session 18 Kafka Integration with Spring Boot

- Integrate Kafka with Spring Boot
- Learn about the Consumers and Producers Model
- Understand Kafka Topics and Events for effective message handling

## Week 10

### Session 19 E-Wallet App like Paytm [Major Project Part 1]

- Start working on E-Wallet App like Paytm
- Project Overview
- Project HLSD
- Project Data Modelling
- Building Microservice Architecture

### Session 20 E-Wallet App like Paytm [Major Project Part 2]

- Major Project Continued
- Project Queries
- Career Guidance