



Java Frameworks Course Content (Spring Boot, Spring Framework, Hibernate & Microservices)

Course Duration: 2–3 Months

Level: Beginner to Advanced

Fee: 8000/ INR

Prerequisites: Core Java and Advanced Java Intermediate Level

Module 1: Java Frameworks Introduction

Lesson 1: What are Java Frameworks?

- Introduction to Frameworks
- Advantages of Frameworks
- Types of Java Frameworks
- MVC Architecture
- Enterprise Application Development

Lesson 2: Development Environment Setup

- Installing JDK
- IntelliJ IDEA / Eclipse
- Maven Installation
- Gradle Introduction
- Git & GitHub Setup

Lesson 3: Maven Fundamentals

- Project Structure
- pom.xml
- Dependencies
- Build Lifecycle
- Plugins





Module 2: Spring Framework Fundamentals

Lesson 1: Introduction to Spring

- Spring Architecture
- Modules of Spring
- Spring Ecosystem
- Spring Container

Lesson 2: Inversion of Control (IoC)

- IoC Concepts
- Dependency Injection
- Constructor Injection
- Setter Injection
- Bean Lifecycle

Lesson 3: Spring Beans

- Bean Configuration
- XML Configuration
- Java Configuration
- Annotation Configuration

Lesson 4: Spring Annotations

- @Component
- @Service
- @Repository
- @Controller
- @Autowired
- @Qualifier

Lesson 5: Spring Expression Language (SpEL)

- Expressions
- Operators
- Collections
- Bean References





Module 3: Spring Boot

Lesson 1: Spring Boot Introduction

- Features
- Auto Configuration
- Starter Projects
- Spring Initializr

Lesson 2: Spring Boot Project Structure

- Packages
- Main Class
- Configuration Files
- Properties vs YAML

Lesson 3: REST API Development

- REST Architecture
- HTTP Methods
- JSON Response
- API Design

Lesson 4: CRUD Application

- Create
- Read
- Update
- Delete
- Exception Handling

Lesson 5: Validation

- Bean Validation
- Custom Validation
- Validation Messages

Lesson 6: Spring Boot Profiles

- Development
- Production





- Testing Profiles

Module 4: Spring MVC

Lesson 1: MVC Architecture

- Model
- View
- Controller

Lesson 2: Controllers

- Request Mapping
- Path Variables
- Request Parameters
- Form Handling

Lesson 3: View Technologies

- JSP
- Thymeleaf
- Templates

Lesson 4: File Upload

- Multipart Files
- Image Upload
- Download Files

Module 5: Spring Data JPA

Lesson 1: JPA Basics

- ORM
- Entity
- Repository

Lesson 2: Entity Mapping





- One-to-One
- One-to-Many
- Many-to-One
- Many-to-Many

Lesson 3: Repository Interfaces

- CrudRepository
- JpaRepository
- PagingAndSortingRepository

Lesson 4: Custom Queries

- JPQL
- Native Queries
- Named Queries

Lesson 5: Pagination & Sorting

- Pagination
- Sorting
- Filtering

Module 6: Hibernate Framework

Lesson 1: Introduction to Hibernate

- ORM Concepts
- Hibernate Architecture
- Session Factory
- Session

Lesson 2: Hibernate Configuration

- XML Configuration
- Annotation Configuration

Lesson 3: CRUD Operations





- Save
- Update
- Delete
- Fetch

Lesson 4: Mapping

- Entity Relationships
- Cascade Types
- Fetch Types

Lesson 5: HQL

- HQL Queries
- Criteria API

Lesson 6: Caching

- First-Level Cache
- Second-Level Cache

Module 7: Spring Security

Lesson 1: Security Fundamentals

- Authentication
- Authorization
- Roles
- Permissions

Lesson 2: Spring Security Setup

- Configuration
- Password Encoder
- User Details Service

Lesson 3: JWT Authentication

- JWT Token
- Login API
- Token Validation



Lesson 4: Role-Based Access Control

- Admin Panel
- User Panel
- Secure APIs

Module 8: Spring Boot Advanced

Lesson 1: Exception Handling

- Global Exception Handler
- Custom Exceptions

Lesson 2: Logging

- Logback
- SLF4J
- Log Levels

Lesson 3: API Documentation

- Swagger
- OpenAPI

Lesson 4: Email Integration

- SMTP
- HTML Emails
- Attachments

Lesson 5: Scheduling

- Cron Jobs
- Scheduled Tasks

Module 9: Microservices

Lesson 1: Microservices Architecture

- Monolithic vs Microservices





- Benefits
- Challenges

Lesson 2: Spring Cloud

- Eureka Server
- Eureka Client

Lesson 3: API Gateway

- Spring Cloud Gateway
- Routing
- Filters

Lesson 4: Configuration Server

- Centralized Configuration
- Git Integration

Lesson 5: Inter-Service Communication

- OpenFeign
- REST Template
- WebClient

Module 10: Testing

Lesson 1: Unit Testing

- JUnit 5
- Assertions
- Test Cases

Lesson 2: Mockito

- Mock Objects
- Dependency Mocking

Lesson 3: Integration Testing





- Spring Boot Test
- Test Containers

Module 11: Deployment

Lesson 1: Packaging

- JAR
- WAR

Lesson 2: Docker Basics

- Docker Installation
- Dockerfile
- Docker Compose

Lesson 3: Cloud Deployment

- AWS
- Azure
- VPS Deployment

Lesson 4: CI/CD

- GitHub Actions
- Jenkins
- Automated Deployment

Module 12: Live Industry Projects

Project 1

Employee Management System

Project 2

Student Management Portal

Project 3





Hospital Management System

Project 4

E-Commerce Backend API

Project 5

Library Management System

Project 6

Online Banking System

Project 7

Inventory Management System

Project 8

Hotel Booking Application

Project 9

Online Examination Portal

Project 10 (Capstone)

Enterprise ERP System using Spring Boot, Spring Security, Hibernate, MySQL, JWT Authentication, REST APIs, Docker, and Microservices

Tools & Technologies Covered

- Core Java
- Advanced Java
- Spring Framework
- Spring Boot
- Spring MVC
- Spring Data JPA



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- Hibernate ORM
- Spring Security
- JWT Authentication
- REST APIs
- Maven
- Gradle
- Git & GitHub
- MySQL
- PostgreSQL
- Docker
- Swagger/OpenAPI
- JUnit 5
- Mockito
- Spring Cloud
- Eureka
- API Gateway
- OpenFeign
- Jenkins
- AWS Deployment

Outcome

By the end of this course, students will be able to:

- Build enterprise-grade Java applications using Spring Framework and Spring Boot.
- Develop secure RESTful APIs with Spring Security and JWT authentication.
- Design and manage databases using Hibernate ORM and Spring Data JPA.
- Create scalable microservices with Spring Cloud components.
- Write unit and integration tests using JUnit and Mockito.
- Containerize and deploy applications using Docker and cloud platforms.
- Complete multiple real-world industry projects and become job-ready as a **Java Spring Boot Developer, Backend Java Developer, or Enterprise Java Full Stack Developer.**



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