



Java and Spring Essentials

- 5 Days
- Lecture and Hands-on Labs

Course Overview

This comprehensive course guides you from Java fundamentals and OOP through building, testing, securing, and deploying enterprise-grade Spring Boot applications. Learn to create REST APIs, integrate databases, implement event-driven architectures with Kafka, apply key design patterns, and containerize your services with Docker for modern cloud-native development.

Review this course online at https://www.alta3.com/courses/java-spring

Who Should Attend

- Aspiring Java Backend Developers
- Software Developers Transitioning to Java/Spring
- Junior to Mid-Level Java Developers
- DevOps Engineers & SREs

What You'll Learn

- Master Core Java fundamentals, Object-Oriented Principles (OOP), and modern Java features
- Develop, test, and debug RESTful APIs and reactive web services with the entire Spring suite
- Implement application security using Spring Security fundamentals and manage environment-specific configurations
- Apply design patterns (SOLID, DDD, CQRS, Saga) to build scalable, maintainable, and resilient applications
- Build event-driven systems by integrating Spring Boot applications with Apache Kafka
- Monitor, diagnose, and manage Spring Boot applications in production-like scenarios using Spring Boot Actuator.
- Containerize Spring Boot applications using Docker for consistent deployment across various environments.

Outline

Day 1 - Core Java, OOP & Development Tools

- 🕮 Lecture: Introducing Java
- \Box Lecture + Lab: Install OpenJDK
- 🖳 Lecture + Lab: Java Data Types
- 🗐 Lecture: Common Manipulations
- 🖳 Lecture + Lab: Variables, Data Types, and Operators
- 🕮 Lecture: if, else, else if, switch
- \Box Lecture + Lab: if, else, else if
- 🖳 Lecture + Lab: Java Switch
- \blacksquare Lecture + Lab: Java Fundamentals Lab
- 🗐 Lecture: Java Arrays

- \blacksquare Lecture + Lab: Java Arrays
- 🖗 Lecture: Loops
- \blacksquare Lecture + Lab: Loops
- 🖳 Lecture + Lab: Control Flow (Loops and Conditionals)
- \blacksquare Lecture: Methods
- \blacksquare Lecture + Lab: Methods and Parameters
- \blacksquare Lecture + Lab: Object Oriented Programming
- \blacksquare Lecture + Lab: public vs static
- \Box Lecture + Lab: Constructors
- \Box Lecture + Lab: toStrings Method
- \blacksquare Lecture: Getters and Setters
- \Box , Lecture + Lab: Classes and Objects in Depth
- 🖳 Lecture + Lab: Debugging with jdb
- 🖳 Lecture + Lab: Introducing jshell
- 💭 Lecture: Setting up IntelliJ

Day 2: Advanced OOP, Collections, Testing & Logging

- 🗐 Lecture: Packages and imports
- 🖳 Lecture + Lab: Java File I/O
- 🖳 Lecture + Lab: Java Packages and Modules
- \Box , Lecture + Lab: Build a Simple CLI Application
- 🖳 Lecture + Lab: Code Style and Best Practices
- 🗐 Lecture: Inheritance, Polymorphism, Abstraction
- 🖳 Lecture + Lab: Inheritance, Polymorphism, and Abstraction
- 🖳 Lecture + Lab: Interfaces and Abstract Classes
- \blacksquare Lecture: Collections and Sorting
- \blacksquare Lecture + Lab: Java Collections and Generics
- \blacksquare Lecture + Lab: Exception Handling and Custom Exceptions
- 🖳 Lecture + Lab: Logging Techniques
- 🖳 Lecture + Lab: Java and HTTP GET Requests
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 ${\ensuremath{\fbox{\tiny \ensuremath{\square}}}}$ Lecture: Apache Maven
- \Box Lecture + Lab: Introduction to Maven
- 🖳 Lecture + Lab: Java Annotations Basics
- 🖳 Lecture + Lab: Logging with SLF4J and Logback
- \Box , Lecture + Lab: Build a Collection-Based App
- \Box , Lecture + Lab: Unit Testing with JUnit

Day 3: Concurrency, Build Tools & SOLID Principles

- \Box , Lecture + Lab: Threading
- 🖳 Lecture + Lab: Concurrency Basics in Java
- \Box , Lecture + Lab: Thread Pools and Executors
- \blacksquare Lecture + Lab: JDBC Fundamentals
- \blacksquare Lecture + Lab: Functional Programming with Streams
- 🖳 Lecture + Lab: Lambda Expressions in Depth
- 🖳 Lecture + Lab: Gradle for Java Projects
- 🖳 Lecture + Lab: SOLID Principles in Practice
- \Box , Lecture + Lab: Introduction to Design Patterns
- \blacksquare Lecture + Lab: File Processing with Streams

Day 4: Spring Fundamentals & Modern Practices

- 🖳 Lecture + Lab: Intro to Java Spring
- \blacksquare Lecture + Lab: Spring Initializr

- 🖳 Lecture + Lab: Spring Framework Core Concepts
- 🖳 Lecture + Lab: Spring Bean Lifecycle
- 🖳 Lecture + Lab: Building REST APIs with Spring Boot
- 🖳 Lecture + Lab: Spring Data JPA Basics
- 🖳 Lecture + Lab: Spring WebFlux Basics
- 🖳 Lecture + Lab: Spring Configuration & Testing Tools
- 🖳 Lecture + Lab: Spring Security Fundamentals
- 🖳 Lecture + Lab: OpenAPI and Swagger Integration
- **<u>L</u>** Lecture + Lab: Spring Profiles and Environment
- \Box Lecture + Lab: Lab: Build a RESTful CRUD API

Day 5: Advanced Spring, Kafka & Capstone Project

- 🖳 Lecture + Lab: Design Patterns in Spring
- 🖳 Lecture + Lab: Spring AOP Basics
- \blacksquare Lecture + Lab: Event-Driven Architecture & Apache Kafka
- 🖳 Lecture + Lab: Monitoring with Spring Actuator
- 🖳 Lecture + Lab: Capstone: Full Spring Boot Application
- 🖳 Lecture + Lab: Capstone: Add Kafka Integration
- 🖳 Lecture + Lab: Capstone: Deploy to Local Docker
- 🖳 Lecture + Lab: Course Wrap-Up and Q&A

Prerequisites

- Basic understanding of programming concepts (e.g., variables, data types, loops, conditional statements).
- Familiarity with using a command-line interface (CLI).

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