Spring: Core Training (SCT)

ID SCT **Price** 3,000.— €(excl. tax) **Duration** 4 days

Course Overview

This 4-day course offers hands-on experience with the major features of Spring and Spring Boot, which includes configuration, data access, REST, AOP, auto-configuration, actuator, security, and Spring testing framework to build enterprise and microservices applications. On completion, participants will have a foundation for creating enterprise and cloud-ready applications.

This course prepares students for the Spring Professional certification exam.

Who should attend

Application developers who want to increase their understanding of Spring and Spring Boot with hands-on experience and a focus on fundamentals.

Prerequisites

Some developer experience using Java, an IDE (Eclipse, STS or IntelliJ) and build tools such as Maven or Gradle

Course Objectives

By the end of the course, you should be able to meet the following objectives:

- Spring configuration using Java Configuration and Annotations
- Aspect oriented programming with Spring
- Testing Spring applications using JUnit 5
- Spring Data Access - JDBC, JPA and Spring Data
- Spring Transaction Management
- Simplifying application development with Spring Boot
- Spring Boot auto-configuration, starters and properties
- Build a simple REST application using Spring Boot, embedded Web Server and fat JARs or classic WARs
- Implementing REST client applications using RestTemplate and WebClient
- Spring Security
- Enable and extend metrics and monitoring capabilities using Spring Boot actuator
- Utilize Spring Boot enhancements to testing

Course Content

- Introduction to Spring
- Spring JAVA Configuration: A Deeper Look
- Annotation-based Dependency Injection
- Factory Pattern in Spring
- Advanced Spring: How Does Spring Work Internally?
- Aspect-oriented programming
- Testing a Spring-based Application
- Data Accss and JDBC with Spring
- Database Transactions with Spring
- Spring Boot Introduction
- Spring Boot Dependencies, Auto-configuration, and Runtime
- JPA with Spring and Spring Data
- Spring MVC Architecture and Overview
- Rest with Spring MVC
- Spring Security
- Actuators, Metrics and Health Indicators
- Spring Boot Testing Enhancements
- Spring Security Oauth (Optional Topic)
- Reactive Applications with Spring (Optional Topic)

Detailed Course Outline

Introduction to Spring

- Java configuration and the Spring application context
- @Configuration and @Bean annotations
- @Import: working with multiple configuration files
- Defining bean scopes
- Launching a Spring Application and obtaining Beans

Spring JAVA Configuration: A Deeper Look

- External properties & Property sources
- Environment abstraction
- Using bean profiles
- Spring Expression Language (SpEL)

Annotation-based Dependency Injection

- Component scanning
- Autowiring using @Autowired
- Java configuration versus annotations, mixing.
- Lifecycle annotations: @PostConstruct and @PreDestroy
- Stereotypes and meta-annotations

Factory Pattern in Spring

- Using Spring FactoryBeans

Advanced Spring: How Does Spring Work Internally?

- The Spring Bean Lifecycle
- The BeanFactoryPostProcessor interception point
- The BeanPostProcessor interception point
- Spring Bean Proxies
- @Bean method return types

Aspect-oriented programming

- What problems does AOP solve?
- Defining pointcut expressions
- Implementing various types of advice

Testing a Spring-based Application

- Spring and Test-Driven Development
- Spring 5 integration testing with JUnit 5
- Application context caching and the @DirtiesContext annotation
- Profile selection with @ActiveProfiles
- Easy test data setup with @Sql

Data Accss and JDBC with Spring

- How Spring integrates with existing data access technologies
- DataAccessException hierarchy
- Spring‘s JdbcTemplate

Database Transactions with Spring

- Transactions overview
- Transaction management with Spring
- Transaction propagation and rollback rules
- Transactions and integration testing

Spring Boot Introduction

- Introduction to Spring Boot Features
- Value Proposition of Spring Boot
- Creating a simple Boot application using Spring Initializer website

Spring Boot Dependencies, Auto-configuration, and Runtime

- Dependency management using Spring Boot starters
- How auto-configuration works
- Configuration properties
- Overriding auto-configuration
- Using CommandLineRunner

JPA with Spring and Spring Data

- Quick introduction to ORM with JPA
- Benefits of using Spring with JPA
- JPA configuration in Spring
- Configuring Spring JPA using Spring Boot
- Spring Data JPA dynamic repositories

Spring MVC Architecture and Overview

- Introduction to Spring MVC and request processing
- Controller method signatures
- Using @Controller, @RestController and @GetMapping annotations
- Configuring Spring MVC with Spring Boot
- Spring Boot packaging options, JAR or WAR

Rest with Spring MVC

- An introduction to the REST architectural style
- Controlling HTTP response codes with @ResponseStatus
- Implementing REST with Spring MVC, @RequestMapping, @RequestBody and @ResponseBody
- Spring MVC’s HttpMessageConverters and automatic content negotiation

Spring Security

- What problems does Spring Security solve?
- Configuring authentication
- Implementing authorization by intercepting URLs
- Authorization at the Java method level
- Understanding the Spring Security filter chain
- Spring security testing

Actuators, Metrics and Health Indicators

- Exposing Spring Boot Actuator endpoints
- Custom Metrics
- Health Indicators
- Creating custom Health Indicators
- External monitoring systems

Spring Boot Testing Enhancements

- Spring Boot testing overview

- Integration testing using @SpringBootTest
- Web slice testing with MockMvc framework
- Slices to test different layers of the application

Spring Security Oauth (Optional Topic)

- OAuth 2 Overview
- Implementing OAuth 2 using Spring Security OAuth

Reactive Applications with Spring (Optional Topic)

- Overview of Reactive Programming concepts
- Reactive Programming support in Spring
- Using Spring’s reactive WebClient

About Fast Lane

Fast Lane is a global, award-winning specialist in technology and business training as well as consulting services for digital transformation. As the only global partner of the three cloud hyperscalers- Microsoft, AWS and Google- and partner of 30 other leading IT vendors, Fast Lane offers qualification solutions and professional services that can be scaled as needed. More than 4,000 experienced Fast Lane professionals train and advise customers in organizations of all sizes in 90 countries worldwide in the areas of cloud, artificial intelligence, cyber security, software development, wireless and mobility, modern workplace, as well as management and leadership skills, IT and project management.

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- ✓ Blended & Hybrid Learning
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