

Core Spring

This course offers hands-on experience with Spring and its major features, including configuration, data access, web and REST applications, Spring Boot, Spring Security and using Spring Cloud to build a small microservices application. On completion, participants will have a foundation for creating enterprise-ready applications.

This course prepares students for the Spring Professional certification exam. Certification exams are sold separately.

PIVOTAL TRAINING APPROACH

Upon completion of this course, participants will understand how to implement the following:

- 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 applications with Spring Boot
- Spring Boot auto-configuration, starters and properties
- Build a simple MVC application using Spring Boot, embedded Web Server and fat JARs or classic WARs
- Implementing REST with Spring MVC and RestTemplate
- Spring Security
- Enable and extend metrics and monitoring capabilities using Spring Boot actuator
- Utilize Spring Boot enhancements to testing

SKU

EDU-1094

DELIVERY METHODS

Public (classroom and virtual)

Private, onsite

DURATION

Four days, instructor-led training

PREREQUISITES

Good understanding of web-application development using Java, an IDE (Eclipse, STS or IntelliJ) and a Servlet engine such as Tomcat or Jetty, specific Java concepts (annotations and lambdas) and dependency management using Maven or Gradle.

TARGET AUDIENCE

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

MORE INFORMATION

On-site training is also available for customers who prefer to bring a Pivotal Certified Instructor to their own facilities. For more information about on-site classes, contact us at

pivotal.io/training/contact.

COURSE MODULES

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)
- How it Works: Inheritance based proxies

ANNOTATION-BASED DEPENDENCY INJECTION

- Autowiring and component scanning
- 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?
- Differences between Spring AOP and AspectJ
- Defining pointcut expressions
- Implementing an advice: @Around, @Before, @After

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 ACCESS AND JDBC WITH SPRING

- How Spring integrates with existing data access technologies
- DataAccessException hierarchy
- Implementing caching using @Cacheable • Embedded databases for testing
- Spring's JdbcTemplate

DATABASE TRANSACTIONS WITH SPRING

- Transactions overview
- Transaction management with Spring
- Isolation levels, transaction propagation and rollback rules
- Transactions and integration testing

SPRING BOOT INTRODUCTION

- Introduction to Spring Boot
- Value Proposition of Spring Boot
- Creating a simple Boot application using Spring Initializr web-site

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

COURSE MODULES CONTINUED

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

ACTUATORS, METRICS AND HEALTH INDICATORS

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

SPRING BOOT TESTING ENHANCEMENTS

- Spring Boot testing overview
- Integration testing and slices
- Slices to test different layers of the application

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INSTRUCTOR-LED TRAINING

Delivery. These courses may be delivered in-person or online, and can be purchased pursuant to a Purchase Order Cancellation Policy.

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Expiration Policy. Instructor-led public training course entitlement expires within 12 months from date of purchase (if purchased online), or 12 months from date of invoice (if purchased pursuant to a Purchase Order), after which You will not be entitled to a refund.

BUSINESS HOURS

Training Services shall be performed by Pivotal from 9:00 A.M. until 5:00 P.M. in the local time zone where the Training Services are being performed by Pivotal, Monday through Friday excluding local statutory holidays (for example, within the State of California for Pivotal's US employees), and any additional holidays that Pivotal grants to its employees, a list of which can be provided by Pivotal to you prior to the commencement of Training Services.