Introduction to Spring 5, Spring Boot, and Spring REST (5 Days)

The Introduction to Spring 5, Spring Boot, and Spring REST training class starts with in-depth coverage of Spring's Core module to reduce coupling and increase the flexibility, ease of maintenance, and testing of your applications. It goes on to cover many of the most important capabilities of Spring, including easing configuration with Spring Boot, integrating JPA persistence layers with Spring and Spring Data, and using Spring's declarative transaction capabilities.

The course includes a solid introduction to Spring REST, and coverage of building RESTful resources. It also covers many of the details of Spring Boot, including how to create Boot-based POMs (maven) for simplified dependency management, customizing Boot behavior, and understanding/managing Boot's auto-configuration.

COURSE OUTLINE

1. **Introduction to Spring**
    - A. Overview of Spring Technology
        - I. Motivation for Spring, Spring Architecture
        - II. The Spring Framework
        - III. maven and Spring
    - B. Spring Introduction
    - . Declaring and Managing Beans
        - I. ApplicationContexts - The Spring Container
        - II. XML and &Component/&Named Config
            - C. Dependencies and Dependency Injection (DI)
    - . Examining Dependencies
        - I. Dependency Inversion / Dependency Injection (DI)
        - II. DI in Spring - XML and &Autowired
2. **Configuration in Depth**

. Java Based Configuration (&Configuration)

- . Overview, &Configuration, &Bean
    - I. Dependency Injection
    - II. Resolving Dependencies
        - A. Integrating Configuration Types
- . XML and &Component Pros/Cons
    - I. &Configuration Pros/Cons
    - II. Choosing a Configuration Style
    - III. Integrating with &Import and <import>

B. Bean Scope and Lifecycle
. Singleton, Prototype, and Other Scopes
I. Configuring Scope
II. Bean Lifecycle / Callbacks
C. Externalizing Properties
. Properties Files
I. &PropertySource, property-placeholder
II. Using &Value
III. SpEL
D. Profiles
. Overview and Configuration
I. Activating Profiles

3. Spring Boot Overview

. Spring Boot Structure
A. Spring POMs with Boot Parents
B. Spring Boot Starters
C. Other Capabilities

4. Spring Testing

. Testing and JUnit Overview
. Writing Tests - Test Classes, asserts, Naming Conventions
I. Running Tests - IDE, maven, ...
II. Test Fixtures - setup and teardown
A. Spring TestContext Framework
. Overview
I. Configuration
II. Running Tests

5. Spring and Spring Data with JPA

. Overview of Spring database support
A. Configuring a DataSource
B. Using Spring with JPA
. Managing the EntityManager (EM)
I. LocalContainerEntityManagerFactoryBean and Container-managed EMs
II. JEE and JNDI Lookup of the EM
III. Configuration and Vendor Adaptors
IV. Creating a JPA Repository/DAO Bean - &PersistenceUnit, &PersistenceContext
C. Spring Data Overview
. Overview and Architecture
I. Configuring Spring Data
II. Repositories and JPA Repositories
III. Using CrudRepository
D. Using Spring Data
. Naming Conventions for Querying
I. Creating more Complex Queries

II. Query Configuration

6. Spring Transaction (TX) Management

. Overview

A. Declarative TX Management (REQUIRED, etc.)
B. TX Scope and Propagation
C. Pointcut-based Configuration of Transactions

7. RESTful Services with Spring

. REST Overview and Principles

A. REST and Spring MVC
. Spring support for REST
I. &RequestMapping/&PathVariable, &RequestBody, &ResponseBody
II. URI Templates and &PathVariable
III. Controllers with &RestController
B. Requests and Responses
C. Ajax Overview

8. Working with JSON and XML

. Generating JSON

. JSON Overview
I. JSON Representations for Resources
II. Message Converters
A. Generating XML
. JAXB and Jackson Message Converters for XML
I. JAXB / &XmlRootElement
B. Content Negotiation

9. Java Clients for RESTful Services

. Client Requirements and Spring's RestTemplate

A. getForObject() / getForEntity()
B. Other RestTemplate Methods
C. Accessing Headers / exchange()

10. Common REST Patterns

. GET: Read

A. POST: Create
B. PUT: Update
C. DELETE: Delete
D. Programming on server side, and client side (with RestTemplate)

11. Boot and its Configuration/Customization

. SpringBootApplication / CommandLineRunner / ApplicationRunner

A. Working with Properties - YAML and .properties
B. Logging and its Configuration
C. Spring TestContext Framework
D. Auto-configuration and Customization

12. Boot Database Support

. Overview and JDBC Support

A. JPA Support

13. Spring Boot Web/Security

. Spring Boot Web

A. Spring Boot Security
B. Spring Boot Data REST

14. Additional Spring 5 Features

. Updates to Spring Core

A. WebFlux / Reactive Web Framework

CLASS MATERIALS

Each student in our Live Online and our Onsite classes receives a comprehensive set of materials, including course notes and all the class examples.

CLASS PREREQUISITES

Experience in the following *is required* for this Spring class:

- Working knowledge of Java programming, including use of inheritance, interfaces, and exceptions.