

**Aim:**

* To gain proficiency in modern Spring development
* To gain deeper understanding of
  + Core Spring Framework
  + Spring Boot
  + Spring Data JPA
  + Spring Actuator
  + Spring Batch
  + Spring AOP
* To learn Maven as a build tool and package manager
* To learn SOLID principles of Spring/Java development

**Duration:**

3 days (standard content)

**Prerequisites:**

* Experience in Java programming
* Understanding of basic object oriented principles (inheritance, polymorphism, encapsulation, interfaces, etc) in Java
* Understanding of application architecture and best practices of enterprise application development is a bonus

**Lab Setup:**

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| --- | --- |
| **Classroom Training** | **Virtual Training** |
| * HD-quality projector or screen with HDMI connectivity * Whiteboard and markers | Access to (one of):   * Zoom Meeting * Skype * Google Meet (Hangout) * Microsoft Teams |

**Environment Setup:**

* Java IDE (any one)
  + IntelliJ IDEA
  + Eclipse
  + Sprint Tool Suite (STS)
  + NetBeans
* JDK 11+ installed and configured
* Maven 3.6 installed configured
* Access to JDK API documentation and other documentation and reference sites
* PostgreSQL or MySQL or Microsoft SQL Server database (remote or local

**Content**

**Day 1: Session 1**

Introduction to Stream processing

Stream creation operators

Functional ideas of map/filter/reduce

Transformation using map

Filtration using filter

Specialized transformation operators

Specialized filtration operators

Aggregating operators

Reducers

Optional<T> class and API

Dealing with identity element in reducers

Patterns of dealing with Optional<T>

**Day 1: Session 2**

Dependency inversion principle

Spring as a dependency injection provider

ApplicationContext

Component scan

Bean configuration

Qualifiers

@Component

XML configuration

**Day 2: Session 1**

Spring Boot and meta-annotations

Auto configuration in Spring Boot

Building RESTful webservices in Spring Boot

Injection mechanisms: constructor, setter, field injections

Decoupling the application components

Working with ResponseEntity<T>

Exception handling in RestController

Hands-on lab

**Day 2: Session 2**

Data modelling using JPA

Entity relationship mapping

Spring Data JPA repositories

Working with services

@Service and @Repository annotations

Automatic query generation in JpaRepository

Writing JPQL queries

Working with ViewModels

Advanced mappings in Hibernate

Using application.properties

Hands-on lab

**Day 3: Session 1**

Introduction to Spring Actuator

Actuator endpoints

Monitoring

Introspection

Customization

Hands-on lab

Spring Expression Language SpEL

Hands-on lab

**Day 3: Session 2**

Aspect-oriented programming using Spring AOP

AspectJ and orthogonal behaviour

Implementing cross-cutting concerns in AOP

Spring AOP Introductions

Hands-on lab

Spring Security overview

Introduction to microservices architecture

Building and containerizing Spring Boot applications

Q & A

Further learning references

Conclusion