



# Spring Boot Syllabus



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# Spring Boot Training Course

## About Course

This course guides you on the path on becoming a developer on Spring Boot. Spring Boot allows you to create stand-alone Spring applications, embed Tomcat, Jetty or Undertow directly without needing to deploy WAR files.

## Target Audience

The Spring Boot Training Course has been designed for both freshers/students and experienced personnel willing to achieve careers as a Java Application programmer, Software Developer, Application Developer on Spring, Java Spring boot Backend Developer, Full Stack Developer on Spring Hibernate and Spring Boot.

## Pre-Requisite

Spring Boot can be learnt without any pre-requisites but it is recommended to have prior knowledge on Java Servlet based Programming (J2EE). A knowledge of Spring Framework will be counted Beneficial.

## Good-to-have Skills

Knowledge of Spring Framework  
Hibernate/JPA implementation

# Course Curriculum

## 1. A Refreshment on Spring Framework

- ✧ Dependency Injection
- ✧ IOC Containers
- ✧ Types of IOC Containers
- ✧ Types of Spring configuration
- ✧ Annotations
- ✧ Java-based Configuration (@Configuration)

### Hands On:

- ✧ Downloading STS / Eclipse
- ✧ Real-time examples on Dependency Injection
- ✧ Use of annotations -component scans, Configuration
- ✧ Creating a Spring project with Java based configuration

## 2. Maven Architecture

- ✧ Brief maven Overview
- ✧ Maven Lifecycle
- ✧ Local .m2 repository
- ✧ Building a Maven Project
- ✧ Defining the dependencies

### Hands On:

- ✧ Creating a Maven Project
- ✧ Defining Archetypes
- ✧ Configuring pom.xml
- ✧ Adding Dependencies for Spring / Spring Boot
- ✧ Adding Tomcat as Dependency

## 3. Spring Boot

- ✧ What is Spring Boot?
- ✧ Spring Boot vs Spring
- ✧ Spring Boot starters project with Maven
- ✧ Application class
- ✧ About @SpringBootApplication annotation
- ✧ Writing our first application with Spring Boot
- ✧ Configuration using application.properties file
- ✧ YAML based Configuration
- ✧ Context Root
- ✧ Managing ports

### Hands On:

- ✧ Creating a Spring Boot Starter project from spring.io
- ✧ Creating a Spring Boot Starter project on IntelliJ
- ✧ Running public static void main(String[] args)
- ✧ Autowiring example on Spring Boot

# Course Curriculum

## 4. Database with Spring Boot

- ✎ Basic Auto-configuration - Datasource and Pooling
- ✎ Configuration Properties
- ✎ Spring Boot's JPA Support - spring-boot-starter-data-jpa
- ✎ A detailed analysis of JPA
- ✎ Using Spring Boot Data – CRUD Repository / JPA Repository
- ✎ Defining Queries with Spring Boot Data

### Hands On:

- ✎ Connecting to h2 database from Spring Boot
- ✎ Connecting to MySQL from Spring Boot
- ✎ CRUD operation example on Spring Boot

## 5. Building Web Application with Spring Boot

- ✎ Spring MVC Controllers
- ✎ Using Model Attributes in Spring Boot
- ✎ Comparison between @RequestMapping and @RequestParam
- ✎ Using a ModelAndView Class
- ✎ Using images and templates for views (Thymeleaf and velocity)
- ✎ Using an Embedded database with JdbcTemplate
- ✎ Executing Sql scripts
- ✎ Using a production database
- ✎ JPA Data and JPA Repositories

### Hands On:

- ✎ Creating a web app for data transportation between Model and View
- ✎ Writing @Controller and autowiring with @Service classes
- ✎ Implementing database connection

## 6. Rest Web Services

- ✎ Introduction to RESTful API Services
- ✎ Comparing REST with SOAP
- ✎ Spring Boot with REST API
- ✎ Spring Support for REST
  - *RequestMapping*
  - *PathVariable*
  - *RequestBody*
  - *ResponseBody*
  - *HTTP Method conversion*
- ✎ URI Templates
- ✎ Creating @RestController
- ✎ JSON Representations for Resources
- ✎ Message Converters
- ✎ Generating XML
- ✎ JAXB and Jackson Message Converters for XML
- ✎ JAXB / @XmlRootElement
- ✎ Content Negotiation

### Hands On:

- ✎ Building RESTful web services for data transportation

# Course Curriculum

## 7. Securing an application with Spring Boot and Spring Security

- ❏ Spring Security Overview
- ❏ DelegatingFilterChainProxy and FilterChainProxy
- ❏ Using Spring Web Authentication
- ❏ The key Classes

### Hands On:

- ❏ Connecting to h2 database from Spring Boot
  - ❏ Connecting to MySQL from Spring Boot
  - ❏ CRUD operation example on Spring Boot
    - *HttpSecurity*
    - *AuthenticationProvider*
    - *UserDetailsService*
    - *UserDetails*
    - *AuthenticationManager*
    - *Authentication*
    - *GrantedAuthorities*
  - ❏ Using your own AuthenticationProvider and UserDetailsService
  - ❏ Hashed passwords and tokens
  - ❏ Spring Security Authorization overview
  - ❏ AccessDecisionManager and AccessDecisionVoters
  - ❏ Using @ControllerAdvice for ExceptionHandling
  - ❏ Authorization using @EnableGlobalMethodSecurity, JSR250
  - ❏ Spring Security Annotations
  - ❏ Using HTTPS
  - ❏ Securing a Restful service via a customized UsernamePasswordAuthenticationFilter
- ### Hands On:
- ❏ Creating custom Authorization Voter and AccessControlManager
  - ❏ Designing a complete Web Application implementation with Spring Security