Spring Framework

**Course Description**

An introduction to the widely-used Java Spring framework. Discover how to wire together your Java objects using spring and dependency injection. You'll learn how to set up your system for spring development, how to use Maven, and how to work with databases using spring and JPA and how to apply transactions using AOP. We'll also look at how to speed up application development using spring boot. Use Spring Batch for jobs and spring social for OAuth.

Spring Boot allows Java developers to create standalone Spring applications that "just run," typically using an embedded instance of Tomcat, Jetty, or Undertow.  These Spring Boot applications require no code generation or XML configuration, while at the same time they feature integrated health monitoring, simplified Maven configuration, and a host of other features that make building, deploying, and running your spring applications far easier.

**Course Duration: 2 days**

**Course Prerequisites**

Experience in the following areas is required:

* Strong Java programming skills are essential
* Participants should be able to do CRUD operations Database
* Participants must be able to read XML documents and to write well-formed XML by hand
* Experience with other Java EE standards, especially servlets and JSP, will be very helpful in class, but is not strictly required.

**Course High Level Contents**

* Introduction to Spring Framework
* Inversion of Control/Dependency Injection
* Aspect Oriented Programming
* Spring JPA integration
* Spring Batch
* Spring Boot
* Spring Social

**Course Detailed Contents**

**Day 1**

**Introduction to Spring Framework.**

* Overview of the Spring Framework
* Spring Containers
* Spring Configuration File
* Spring Beans

**Inversion of Control / Dependency Injection**

* Beans, BeanFactory and the ApplicationContext
* Dependency Injection
* Setter Injection and Constructor Injection
* Setting bean properties and collaborators

**Aspect-Oriented Programming**

* AOP Concepts
* Crosscutting Concerns, Advice, JoinPoint and PointCut
* Advice types in Spring

**Implementing Enterprise Information Connectivity [Integrating JPA with spring]**

* + The LocalContainerEntityManagerFactoryBean
  + Different states of an Object: Transient state, persistent/ managed state, Detached state and removed state.
  + Persisting an entity
  + Executing queries
  + Named Queries

**Transaction management**

* + The spring transaction abstraction.
  + Transaction strategies.
  + Declarative transaction management
* Spring RESTful services
* Spring Batch
  + Batch processing
  + Spring Batch framework
    - Jobs
    - Job Launcher
    - Job Instance
    - Job Repositories
    - Item Readers
    - Item Writers
    - Item Processors
    - Custom Writers, Readers and Processors

Day 2

* Spring Boot
  + What is Spring Boot?
  + Why Spring Boot?
  + Main goal of Spring Boot
  + Limitation of Spring Boot
  + Using spring boot CLI tool
  + Developing your first Spring Boot application
  + Using @SpringBootApplication annotation
  + Spring Boot Auto-configuration
  + Spring Initializr [bootstrap your application]
  + Spring Data
    - Spring Data JPA
    - Transactions
  + Spring Actuator
  + Spring Restful services
* Spring Social
  + Socializing applications
  + What is Social login?
  + OAuth
  + Getting spring social
  + Spring Social Facebook/Twitter integration example

**Lab Requirements:**

* + JDK 8
  + Eclipse for JEE (Mars or Neon)
  + Apache Tomcat 8
  + Maven 3.x version [ Network is a must, applications are developed using maven dependencies]
  + Spring Tool Suite
  + MySQL database