Course Name: **Java – Spring Boot**
Duration: **40 Hrs (5 days)**

Day -1

Introduction to Java

- The Java SE Development Kit (JDK)
- Java Basics Syntax
- Development Environment
- Naming Conventions
- Branching, Iteration
- Class Definition
- Creating Packages
- Encapsulation and Access Control, public and private Access
- Static Members of a Class

Objects in Java

- Constructors
- Method overloading

Reusing Classes

- Inheritance
- Overriding
- Abstract classes and methods
- Sealed Classes
- Records

Interfaces

- Interfaces
- Implementations
- Default and Private Methods

Day – 2

Error/Exception Handling

- Introduction to Exception and Errors
- Create a try Block and catch Block.
- Catch Multiple Exception Errors
- Create a finally Block.
- Custom Exceptions
- Try with Resource and Improved Exception Handling

Multitasking

- What is a Thread?
- Creating a thread using Runnable & Thread
- Thread class methods
- Thread life cycle
- synchronization
- Introduction to Executor Framework

Object Containers and Collections

- Collections
- ArrayList
- HashSet,TreeSet
- HashMap

- Arrays class
- Comparable, Comparator
- Performance of Different Collection Classes

Lambda and Stream Processing

- Functional Programing basics
- Lambda expression in Java
- Functional Interfaces
- Using Lambda Expressions
- Stream Processing

Day - 3

Spring Boot

- Spring In Context – Core Concepts
- Spring Inversion of Control
- Dependency Injection
- Constructor Injection
- Setter Injection

Spring Boot Features

- Setting Up Development Environment
- Creating a Spring Boot project
- Starting a Spring Boot application
- Using @EnableAutoConfiguration, @ComponentScan, @Configuration
- Use of @SpringBootAppilcation annotation
- Packaging, SpringApplication class
- External Configuration
- Profiles and Logging

Spring MVC and RESTful applications

- Introduction to Spring MVC and request processing
- Controller method signatures
- Using @Controller, @RestController and @GetMapping annotations
- REST Application with Spring Boot
- @RestController Annotation
- Stereotypes Using with REST Controllers
- Custom Query Methods
- Quick test of services by using Postman

Day – 4

TDD and Spring Boot Applications

- TDD and Spring Boot Testing
- Developing Spring boot applications with TDD approach
- Testing Spring Boot Applications

Data Access with Spring Boot

- Spring Data JPA & Rest
- Spring Data JPA: The Data Tier
- @Repository Annotation
- Introduction to JPA
- Adding Spring Data JPA
- Creating a Spring Data JPA Repository
- Making CRUD REST Application using Operations with Repository

ACTUATOR

- What are Actuators
- Default Endpoints
- Exposing EndPoints
- Overview of Info and Health Endpoints

Day - 5

Introduction to Microservices

- Problems with Monolithic Application
- What and Why Microservices ?
- Advantages and disadvantages of microservices
- When not to use Microservice architecture?
- Use case for Microservices
- Micro Services Concepts
    - Service Discovery
    - Client-Side Load Balancing
    - CircuitBreaker and Retry
    - API Gateway

Microservices Intercommunication

- Build a client microservices
- Use of RestTemplate and RestClient
- Discuss on Event Driven Microservices with Kafka

Spring Security (**Demo only, No Hands on**)

- Spring Security fundamentals
- Spring Web Security configuration(In memory)
- Usage of OAuth/SSO in microservices (Explanation and demo)