



**Course Name:** Java Developer Professional Certification Program

### **Course Overview**

This comprehensive Java and Spring Framework Program spans 22 modules, beginning with the fundamentals of Java, including its environment and architecture, and advancing through complex concepts in object-oriented programming, multithreading, and exception handling. The curriculum covers practical applications with JDBC, JSP, and servlets, and delves into modern Java features like streams and lambda expressions. Additionally, it includes extensive training in the Spring ecosystem, Hibernate, and Maven, culminating in an internship program that applies these skills in real-world projects to prepare participants for professional roles in software development.

### **What You'll Learn?**

In this Program, you will learn Java fundamentals, object-oriented programming, and Java's advanced features such as multithreading and JDBC. You'll also gain expertise in Spring Framework, Hibernate, and Maven, building robust web applications and services. The Program concludes with hands-on projects and a professional internship, equipping you with practical skills for software development careers.

### **Internship Program:**

In addition to the Program, you will participate in a 3-month internship involving six live projects. Upon successful completion, you will receive an Internship Certificate.

### **Letter of Recommendation:**

Upon successfully completing the program and internship, you will also receive a Letter of Recommendation (LOR).

### **Duration:**

60 Hours (10 Weeks) + 3 Months (Internship Program)

### **Requirements:**

Java, Eclipse, Maven and Tomcat

### **Pre-requisite:**

None

## Curriculum

### Module 1. Fundamentals

1. Introduction to Java
2. Features of Java
3. Java Environment, JVM, Java IDEs
4. Sample Java Program

### Module 2. Variables, Data Types and Conditional Statements

1. Different data types in Java
2. How variables are created or initialized in Java
3. What are the conditional statements, and how we can implement these conditional statements?
4. What are the operators and modifiers, and how they are implemented in Java?
5. All the looping statements like for, while and do-while

### Module 3. Data Handling and Functions

1. Arrays
2. String Handling - String, StringBuffer Classes
3. Functions, Function with Arguments

### Module 4. Objects, Classes and Methods

1. What are Objects and Classes, and how we can create them in Java?
2. What is Overloading and Overriding in Java?
3. What are the constructors, and what is the role of constructors in Java?

### Module 5. Advanced OOPS Concepts

1. Inheritance
2. Polymorphism or Runtime Polymorphism and Compile-time Polymorphism.
3. Abstraction
4. Encapsulation
5. Different keywords like This and Super
6. Composition
7. Aggregation
8. Association

### Module 6. Packages and Multithreading

1. Packages and Interfaces
2. Abstract Class and Method



3. Nested Interface
4. Time, Lang, Math and other packages

#### **Module 7. Exception Handling, Thread, Multithreading and I/O Streams concepts**

1. Exception Handling
2. Access Specifiers: Public, Private, Protected and Package
3. Exception Handling: Try, Catch, Finally, Throw and Throws
4. Multi-Threading: Runnable Interface, Extending a Thread Class, Synchronization in Threads

#### **Module 8. Java Collections**

1. Wrapper Classes and Inner Classes: Integer, Character, Boolean, Float, etc.
2. Collections: ArrayList, Vector, HashSet, TreeSet, HashMap, HashTable, Java.util
3. Java.lang

#### **Module 9. Java 8 Features**

1. Lambda Expressions
2. Functional Interfaces
3. Streams

#### **Module 10. JDBC**

1. Introduction to SQL: Connect, Insert, Update, Delete, Select
2. Introduction to JDBC and Architecture of JDBC
3. Types of Drivers: Type 1/2/3/4 drivers
4. Insert/Update/Delete/Select Operations using JDBC
5. Batch Processing Transaction Management: Commit and Rollback

#### **Module 11. Servlets**

1. Introduction to Web Technologies
2. Type of Servlets: Generic and Http Servlet
3. Request Dispatchers: Forward and Include
4. 4 types of Session Tracking and Filters

#### **Module 12. JSP**

1. Introduction to JSP
2. Architecture of JSP
3. Tags (Scripts, declarative, expression)
4. Implicit objects
5. JSP Directives, JSP and JDBC



### **Module 13. Maven**

1. Installation
2. Build Phases

### **Module 14. Servlet Containers**

1. Various Servlet Containers
2. Jetty, Jboss, WildFly, Weblogic, WebSphere, etc
3. Tomcat
  - i. Installation
  - ii. Configure tomcat in eclipse
  - iii. Change tomcat server port

### **Module 15. IDE**

1. Eclipse
2. IntelliJ

### **Module 16. Hibernate**

1. Introduction to Hibernate, Setting up Hibernate
2. Architecture of Hibernate
3. Database Operations: Insert/Update/Delete/Select
  - @Entity
  - @Table
  - @Column
  - @Id
4. Mappings
  - i. One to One Mapping
  - ii. One to Many Mapping
  - iii. Many To One Mapping
  - iv. Many To Many Mapping



## 5. Inheritance

- i. Single Table Strategy
- ii. Table Per Class Strategy
- iii. Joined Strategy

## 6. HQL

## 7. Named Queries using HQL and SQL

### **Module 17. Spring**

1. Introduction to Spring Framework
2. Architecture
3. IoC Containers
4. Bean Definition and Scopes, Bean Post Processors
5. Dependency Injection Auto-Wiring
6. Lazy and Eager Instantiation of Beans
7. Bean Definition Inheritance

@Qualifier

@Primary

'@Configuration

'@Bean

@Required

### **Module 18. Spring and Design Patterns**

1. Aspect Oriented Programming (AOP)
2. Integrating Spring framework with Hibernate
3. Design Patterns: DAO, DTO, MVC
4. Intercepting filters, Front Controller, Business Delegate

### **Module 19. Spring Boot/Spring Rest**

1. Various ways of creating a spring boot application
  - i. Spring.io
  - ii. Spring Initializer
  - iii. Spring Boot CLI



2. Data Formats

i. XML

ii. JSON

3. @Value

4. Profiles and @Profile

5. @Autowired

6. @ComponentScan

7. @Component

@Controller

@RestController

@Service

@Repository

8. @PathVariable

9. @RequestParam

10. Rest Services - CRUD Operations

**Module 20. Interview**

1. Interview Preparation
2. Mock interviews

**Module 21. Projects**

1. Leave Management System
2. Employee Management System
3. Project Support

**Module 22. Java Professional Internship Program**

3 Professional Internship Projects