Diploma in Java Full Stack Development

Duration: 6 Months

Course Overview

The **Diploma in Java Full Stack Development** is designed to equip learners with in-demand skills for building enterprise-level web applications. The course covers **Core Java programming**, **Advanced Java concepts**, **JDBC, Hibernate, Spring Boot framework**, and **unit testing with JUnit** for back-end mastery. On the front-end side, students will gain skills in **HTML, CSS, and JavaScript** to design responsive user interfaces. By the end, learners will be able to build, test, and deploy complete Java full stack applications.

Course Objectives

1. To provide strong foundations in **Core Java programming** and OOP concepts.
2. To train students in **Advanced Java concepts** like Servlets and JSP.
3. To introduce **database programming** with JDBC.
4. To teach ORM with **Hibernate** for efficient database handling.
5. To familiarize learners with **Spring Boot** for building scalable enterprise applications.
6. To build front-end development skills using **HTML, CSS, and JavaScript**.
7. To develop skills in **testing using JUnit**.
8. To prepare students for careers as **Java Full Stack Developers** through project-based learning.

Course Outcomes

After completing this course, students will be able to:

- Write clean, efficient, and modular programs in **Core Java**.
- Build **dynamic web applications** using Servlets and JSP.
- Integrate **Java applications with relational databases** using JDBC and Hibernate.
- Develop enterprise-level applications using **Spring Boot**.
- Design **responsive front-end interfaces** using HTML, CSS, and JavaScript.
- Test and debug applications with **JUnit**.

- Deploy and manage **Java full stack applications**.
- Work as **Java Full Stack Developers, Software Engineers, or Backend Developers**.

Course Syllabus

Module 1: Introduction to Full Stack Development

- Overview of Full Stack Development
- Client-Server Architecture & MVC Pattern
- Tools Setup: Eclipse/IntelliJ, JDK, Maven/Gradle, Git & GitHub

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Module 2: Front-End Development

- **HTML**: Structure, Forms, Tables, Semantic HTML
- **CSS**: Selectors, Box Model, Flexbox, Grid, Responsive Design
- **JavaScript**: Variables, Functions, Events, DOM Manipulation
- Mini Project – Responsive Website with Form Validation

Module 3: Core Java

- Java Basics: Data Types, Variables, Operators
- Control Statements (if-else, loops, switch)
- Arrays & Strings
- OOP Concepts: Classes, Objects, Inheritance, Polymorphism, Encapsulation, Abstraction
- Exception Handling & Packages
- Collections Framework (List, Set, Map)
- Multithreading & File Handling
- Mini Project – Student Management System

Module 4: Advanced Java

- Java Servlets – Request/Response, Sessions, Cookies

- JSP (Java Server Pages) – Directives, Scripting, Expressions
- MVC Architecture in Web Applications
- Java Beans
- Mini Project – Online Feedback System

Module 5: JDBC (Java Database Connectivity)

- Introduction to JDBC & Drivers
- CRUD Operations with JDBC
- Connecting Java Apps with MySQL/Oracle
- Prepared Statements & Transactions
- Mini Project – Employee Database App

Module 6: Hibernate (ORM Tool)

- Introduction to ORM & Hibernate
- Hibernate Configuration & Mapping
- Annotations & Associations (One-to-One, One-to-Many, Many-to-Many)
- HQL (Hibernate Query Language)
- Integrating Hibernate with JDBC
- Mini Project – Inventory Management System

Module 7: Spring Boot Framework

- Introduction to Spring & Spring Boot
- Spring Boot Project Setup (Maven/Gradle)
- Dependency Injection & Annotations
- Spring Boot with REST APIs
- Connecting Spring Boot with Hibernate/JPA
- Spring Security Basics (Authentication & Authorization)
- Mini Project – RESTful API for E-commerce

Module 8: JUnit Testing

- Introduction to Unit Testing
- Writing Test Cases in JUnit
- Assertions & Annotations
- Testing Spring Boot Applications

Module 9: Deployment & Version Control

- Git & GitHub Workflow
- Packaging & Deploying Java Applications
- Deployment on Tomcat, AWS/Heroku
- CI/CD Basics

Module 10: Final Project & Assessment

- Full Stack Java Application combining Front-End + Back-End + Database
- Examples: E-commerce App, Online Banking System, Student Portal
- Deployment & Presentation

☑ This syllabus ensures students become **industry-ready Java Full Stack Developers** with exposure to **projects, testing, and deployment**.