



Java FullStack - Syllabus

Java Core

1 Introduction to Java

- History and Evolution of Java
- Java's Place in Modern Development

2 Java Installation

- Installing JDK and JRE
- Setting up Environment Variables

3 Basic Concepts

- Syntax and Semantics
- Variables, Data Types, and Operators
- Control Structures (if-else, switch, loops)

4 Object-Oriented Programming (OOP)

- Classes and Objects
- Inheritance, Polymorphism, Encapsulation, and Abstraction
- Interfaces and Abstract Classes

5 Core Libraries

- **Collections Framework (List, Set, Map)**
- **Exception Handling**
- **Input/Output Streams**
- **Multithreading and Concurrency**

MySql

1 Introduction to MySQL

- **What is MySQL?**
- **MySQL vs. Other Databases**

2 Installation and Setup

- **Installing MySQL Server**
- **Using MySQL Workbench**
- **Command-Line Basics**

3 Database Concepts

- **Databases, Tables, and Relationships**
- **Data Types in MySQL**

4 CRUD Operations

- **Creating, Reading, Updating, and Deleting Records**
- **SQL Syntax and Queries**

5 Advanced SQL

- **Joins (Inner, Outer, Left, Right)**
- **Indexes**
- **Stored Procedures and Functions**
- **Triggers**

Frontend (HTML and CSS)

1 HTML Basics

- **HTML Structure**
- **Elements and Attributes**
- **Forms and Input Elements**
- **HTML5 New Elements**

2 CSS Basics

- **CSS Syntax**
- **Selectors, Properties, and Values**
- **Box Model (Margin, Border, Padding, Content)**
- **Positioning and Layout (Float, Flexbox, Grid)**

3 Advanced CSS

- **CSS3 New Features**
- **Transitions and Animations**
- **Responsive Design (Media Queries)**

Spring Boot

1 Introduction to Spring Boot

- **Overview of Spring Framework**
- **Advantages of Spring Boot**

2 Setting Up Spring Boot

- **Installing and Configuring Spring Boot**
- **Using Spring Initializr**
- **Project Structure**

2 Core Concepts

- **Dependency Injection**
- **Spring Boot Annotations**
- **Application Properties and Configuration**

3 Building RESTful Services

- **Creating Controllers**
- **Handling Requests and Responses**
- **Using Spring Data JPA for Database Integration**

4 Security

- **Introduction to Spring Security**
- **Implementing Basic Authentication**

5 Advanced Spring Boot

- **Custom Error Handling**
- **Integrating with Frontend (Thymeleaf, React, Angular)**
- **Deploying Spring Boot Applications**

Projects

Project 1: CRUD Application

Description: Create a simple CRUD (Create, Read, Update, Delete)

application using Spring Boot, Hibernate, MySQL, and a frontend with HTML/CSS/JavaScript.

Features:

- **User Management (Create, Read, Update, Delete)**
- **Product Management (Create, Read, Update, Delete)**

Technologies Used:

- **Backend: Spring Boot, Hibernate, MySQL**
- **Frontend: HTML, CSS, JavaScript (optional: use a framework like React or Angular)**

Steps:

- **Set up Spring Boot project with dependencies for Hibernate and MySQL.**
- **Create entity classes and repositories for users and products.**
- **Implement CRUD operations in the service layer.**
- **Create RESTful controllers for handling requests.**
- **Develop frontend pages for listing, adding, editing, and deleting users and products.**
- **Connect frontend with backend using AJAX or fetch API.**

Project 2: User Login and Authentication

Description: Develop a user login and registration system with Spring Boot, Spring Security, Hibernate, MySQL, and a frontend using HTML/CSS/JavaScript.

Features:

- **User Registration**
- **User Login**
- **Authentication and Authorization**
- **Role-Based Access Control**

Technologies Used:

- **Backend: Spring Boot, Spring Security, Hibernate, MySQL**
- **Frontend: HTML, CSS, JavaScript (optional: use a framework like React or Angular)**

Steps:

- **Set up Spring Boot project with dependencies for Spring Security, Hibernate, and MySQL.**
- **Create entity classes for users and roles.**
- **Configure Spring Security for authentication and authorization.**
- **Implement user registration and login functionalities.**
- **Create RESTful controllers for handling user-related requests.**
- **Develop frontend pages for user registration and login.**

Secure application endpoints based on user roles.