

Course Title: Full Stack Java Development Course Syllabus

Course Description: This course provides a comprehensive overview of Full Stack Java development, covering frontend and backend technologies. Students will learn how to build dynamic and interactive web applications using Java for backend development and modern frameworks for frontend development. The course includes topics such as Java programming, Spring framework, JavaScript, React.js, database integration, and deployment strategies.

Prerequisites: Basic understanding of programming concepts and web development. Familiarity with Java programming language is helpful but not required.

Course Objectives:

1. Understand the principles and technologies involved in Full Stack Java development.
2. Learn how to develop backend applications using Java and Spring framework.
3. Gain proficiency in building responsive and interactive user interfaces using JavaScript and React.js.
4. Develop skills in integrating frontend and backend components to create full-stack web applications.
5. Explore advanced topics such as RESTful APIs, database management, and deployment strategies.

Course Outline:

- 1. Introduction to Full Stack Development**
 - Overview of Full Stack development
 - Frontend vs. Backend development
 - Introduction to Java and JavaScript
- 2. Java Programming Basics**
 - Variables, data types, and operators
 - Control structures (if-else, switch, loops)
 - Object-oriented programming concepts
- 3. Introduction to Spring Framework**
 - Overview of Spring framework
 - Spring Boot for rapid application development
 - Dependency Injection and Inversion of Control (IoC)
- 4. Building RESTful APIs with Spring Boot**
 - Creating REST controllers
 - Handling HTTP requests and responses
 - RESTful routing and resource mapping

5. Database Integration with Spring Data

- Connecting to databases using Spring Data
- Working with JPA (Java Persistence API)
- CRUD operations with Spring Data repositories

6. Frontend Development with JavaScript

- Introduction to JavaScript
- DOM manipulation and event handling
- Working with asynchronous JavaScript (Promises, async/await)

7. Introduction to React.js

- Overview of React.js library
- Setting up React.js development environment
- Components and props in React.js

8. State Management in React.js

- Managing state with useState and useContext hooks
- Redux for state management in larger applications
- React Router for client-side routing

9. Responsive Web Design with CSS and Bootstrap

- Introduction to CSS for styling web pages
- Using Bootstrap framework for responsive design
- Customizing Bootstrap themes

10. Authentication and Authorization

- Implementing user authentication with Spring Security
- Securing frontend routes and components
- JSON Web Tokens (JWT) for stateless authentication

11. Integration of Frontend and Backend

- Consuming RESTful APIs from frontend applications
- Handling CORS (Cross-Origin Resource Sharing)
- Implementing data exchange between frontend and backend

12. Deployment and DevOps Practices

- Deployment strategies for Full Stack Java applications
- Continuous Integration and Continuous Deployment (CI/CD)
- Docker containers for application packaging and deployment

Assessment:

- Weekly assignments to reinforce learning concepts.
- Midterm project: Developing a backend RESTful API using Spring Boot.
- Final project: Designing and implementing a Full Stack Java web application using React.js for frontend and Spring Boot for backend.

Textbook: "Spring Boot in Action" by Craig Walls

Additional Resources:

- Online tutorials and documentation (Spring official documentation, React.js official documentation, etc.).
- Supplemental readings and materials provided by the instructor.

Grading:

- Assignments: 30%
- Midterm Project: 20%
- Final Project: 40%
- Participation and Attendance: 10%

Attendance Policy: Regular attendance is expected. Students are allowed a maximum of three unexcused absences. Excessive absences may result in a reduction of the final grade.

Office Hours: Instructor office hours will be held twice a week for additional help and clarification.

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