

Java Full Stack Spring Boot and Angular

Course outline

Module 1: Introduction to Java

Module 1: Introduction to Java is an introductory course designed to provide students with a comprehensive overview of the Java programming language. This module covers the fundamentals of the language, including variables, data types, operators, control flow, classes, objects, and more. It also introduces the Spring Boot and Angular frameworks, which are used to build modern web applications. By the end of this module, students will have a solid understanding of the Java language and be able to start building their own applications.

Lessons

- Overview of Java and its features
- Setting up the development environment
- Understanding the Java language syntax
- Working with variables, data types, and operators
- Writing and executing Java programs
- Working with classes and objects
- Understanding inheritance and polymorphism
- Working with exceptions and error handling
- Working with packages and libraries
- Working with threads and concurrency
- Working with collections and generics
- Working with JDBC and databases
- Working with web services and REST APIs
- Working with Spring Boot and Angular frameworks

After completing this module, students will be able to:

- Understand the fundamentals of the Java programming language
- Create basic Java programs using variables, data types, and control flow
- Utilize the Java API to create classes and objects
- Debug and troubleshoot Java code using the Eclipse IDE

Module 2: Object-Oriented Programming with Java

Module 2 of the Java Full Stack Spring Boot and Angular course focuses on Object-Oriented

Programming with Java. It covers topics such as classes, objects, inheritance, polymorphism, and interfaces. Students will learn how to create and use classes, create and use objects, and use inheritance and polymorphism to create more efficient and reusable code. Additionally, students will learn how to use interfaces to create more flexible and extensible code.

Lessons

- Introduction to Object-Oriented Programming
- Classes and Objects
- Inheritance and Polymorphism
- Interfaces and Abstract Classes
- Exception Handling
- Generics
- Collections Framework
- Streams and Lambda Expressions
- JavaFX
- Java Database Connectivity (JDBC)
- Java Networking
- Java Security
- Java Web Services
- JavaBeans
- Java Applets
- Java Native Interface (JNI)
- Java Reflection API
- Java Native Access (JNA)
- Java Native Development Kit (JDK)
- Java Persistence API (JPA)

After completing this module, students will be able to:

- Understand the fundamentals of Object-Oriented Programming (OOP) and its principles.
- Implement classes, objects, and methods in Java.
- Create and use inheritance and polymorphism in Java.
- Utilize the Java Collections Framework to store and manipulate data.

Module 3: Spring Boot Basics

Module 3 of the Java Full Stack Spring Boot and Angular course covers the basics of Spring Boot, a popular Java framework for creating web applications. Students will learn how to create a basic Spring Boot application, configure it, and deploy it to a web server. Additionally, students will learn how to use the Spring Boot CLI to create and manage projects, as well as how to use the Spring Boot Actuator to monitor and manage applications.

Lessons

- Introduction to Spring Boot
- Setting up a Spring Boot Project
- Configuring Spring Boot Properties

- Working with Controllers and Services
- Creating RESTful APIs with Spring Boot
- Working with Spring Data JPA
- Integrating Spring Boot with Angular
- Deploying Spring Boot Applications
- Troubleshooting Spring Boot Applications
- Best Practices for Spring Boot Development

After completing this module, students will be able to:

- Understand the fundamentals of Spring Boot and its components
- Develop and deploy a Spring Boot application
- Utilize the Spring Boot framework to create RESTful web services
- Integrate Spring Boot with Angular to create a full stack application

Module 4: Building RESTful Web Services with Spring Boot

Module 4 of the Java Full Stack Spring Boot and Angular course focuses on building RESTful web services with Spring Boot. Students will learn how to create and configure a Spring Boot application, create RESTful web services, and use Spring Boot to create a secure web application. Additionally, students will learn how to use Spring Boot to create a web application with a database and how to deploy the application to the cloud.

Lessons

- Introduction to RESTful Web Services
- Designing RESTful APIs
- Implementing RESTful Web Services with Spring Boot
- Securing RESTful Web Services
- Testing RESTful Web Services
- Deploying RESTful Web Services
- Consuming RESTful Web Services with Angular
- Troubleshooting RESTful Web Services
- Advanced Topics in RESTful Web Services

After completing this module, students will be able to:

- Understand the fundamentals of RESTful web services and how to build them using Spring Boot.
- Develop a RESTful web service using Spring Boot and deploy it to a cloud platform.
- Create a secure RESTful web service using Spring Security.
- Utilize the Spring Boot Actuator to monitor and manage the web service.

Module 5: Working with Relational Databases and JPA

Module 5 of the Java Full Stack Spring Boot and Angular course focuses on working with relational databases and JPA (Java Persistence API). Students will learn how to create and manage databases,

use JPA to access and manipulate data, and use the Spring Data JPA framework to create data access layers. Additionally, students will learn how to use the Hibernate ORM framework to map objects to database tables.

Lessons

- Introduction to Relational Databases
- Understanding the SQL Language
- Working with JDBC
- Introduction to JPA
- Configuring JPA
- Working with Entities
- Querying with JPQL
- Advanced JPA Features
- Working with Native Queries
- Transactions and Concurrency
- Caching with JPA
- Integrating JPA with Spring Boot
- Building a REST API with Spring Boot and JPA

After completing this module, students will be able to:

- Understand the fundamentals of relational databases and how to use them in Java applications.
- Create and manage database tables and relationships using JPA.
- Utilize JPA to query and manipulate data in a relational database.
- Implement the CRUD operations for a database using JPA.

Module 6: Building Web Applications with Spring MVC

Module 6 of the Java Full Stack Spring Boot and Angular course focuses on building web applications with Spring MVC. Students will learn how to create a web application using the Spring MVC framework, as well as how to configure and deploy the application. Additionally, students will learn how to use the Spring MVC framework to create RESTful web services and how to integrate Angular with Spring MVC.

Lessons

- Introduction to Spring MVC
- Configuring Spring MVC
- Creating Controllers and Views
- Working with Form Data
- Validating Form Data
- Working with Database and JPA
- Implementing Security
- Creating RESTful Web Services
- Integrating with Angular
- Deploying Spring MVC Applications

After completing this module, students will be able to:

- Develop web applications using Spring MVC framework.
- Implement the Model-View-Controller (MVC) design pattern.
- Create RESTful web services using Spring MVC.
- Integrate Angular with Spring MVC to create dynamic web applications.

Module 7: Introduction to Angular

Module 7 of the Java Full Stack Spring Boot and Angular course introduces students to the Angular framework. Students will learn the basics of Angular, including components, modules, services, and routing. They will also learn how to create a basic application using Angular and how to integrate it with a Spring Boot backend. By the end of the module, students will have a good understanding of how to use Angular to create dynamic web applications.

Lessons

- Introduction to Angular Architecture
- Setting up an Angular Development Environment
- Creating Components and Services
- Working with Data and HTTP Requests
- Routing and Navigation
- Building Reactive Forms
- Using Pipes and Directives
- Working with Modules and Dependency Injection
- Testing Angular Applications
- Deploying an Angular Application

After completing this module, students will be able to:

- Understand the fundamentals of the Angular framework and its components
- Create and configure components, services, and modules in an Angular application
- Utilize the Angular CLI to generate components, services, and modules
- Implement routing and navigation in an Angular application

Module 8: Building Single Page Applications with Angular

Module 8 of the Java Full Stack Spring Boot and Angular course focuses on building single page applications with Angular. Students will learn how to create a basic Angular application, use components, and create services. They will also learn how to use the Angular CLI to create and manage projects, as well as how to use the Angular Router to create routes and navigate between pages. Finally, they will learn how to use the Angular HttpClient to make API calls and consume data from a backend.

Lessons

- Introduction to Angular
- Setting up the Development Environment

- Creating Components and Services
- Working with Data and HTTP
- Routing and Navigation
- Building Reusable Components
- Working with Forms
- Testing Angular Applications
- Deploying Angular Applications
- Debugging Angular Applications

After completing this module, students will be able to:

- Understand the fundamentals of Angular and its components
- Develop single page applications using Angular
- Utilize the Angular CLI to create and manage projects
- Implement routing and navigation in Angular applications

Module 9: Working with Data and APIs in Angular

Module 9 of the Java Full Stack Spring Boot and Angular course focuses on working with data and APIs in Angular. Students will learn how to use the Angular HTTP client to make requests to a server, how to use observables to handle asynchronous data, and how to use the Angular Router to navigate between components. Additionally, students will learn how to use the Angular CLI to create and manage projects, and how to use the Angular Material library to create user interfaces.

Lessons

- Introduction to Data and APIs in Angular
- Working with HTTP Requests in Angular
- Consuming RESTful APIs in Angular
- Using Observables to Handle Asynchronous Data
- Working with Local Data Storage in Angular
- Creating Custom Services to Manage Data
- Implementing Authentication and Authorization with Angular
- Securing Data with Angular
- Debugging Data and API Issues in Angular
- Testing Data and API Services in Angular

After completing this module, students will be able to:

- Understand how to use the Angular HttpClient to make HTTP requests to a server.
- Be able to use the Angular Router to navigate between components.
- Know how to use the Angular Reactive Forms to create forms and validate user input.
- Be able to use the Angular HttpClient to make API calls to a server and display the data in the UI.

Module 10: Deploying Spring Boot and Angular Applications

Module 10 of the Java Full Stack Spring Boot and Angular course covers the process of deploying Spring Boot and Angular applications. It covers topics such as setting up a production environment, deploying applications to the cloud, and configuring continuous integration and delivery. Additionally, the module covers topics such as setting up a database, configuring security, and troubleshooting deployment issues.

Lessons

- Overview of Deployment Strategies
- Setting up a Continuous Integration Pipeline
- Deploying Spring Boot Applications to Cloud Platforms
- Deploying Angular Applications to Cloud Platforms
- Automating Deployment with Docker
- Securing Deployed Applications
- Troubleshooting Deployment Issues
- Best Practices for Deployment

After completing this module, students will be able to:

- Understand the fundamentals of deploying a Spring Boot and Angular application.
- Be able to deploy a Spring Boot and Angular application to a cloud platform such as AWS or Azure.
- Be able to configure and manage the application in the cloud.
- Be able to troubleshoot and debug any issues that may arise during the deployment process.