

Java Spring Boot

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This course is designed to equip students with a solid foundation in **Java** programming and the **Spring Boot framework**. The course provides a comprehensive understanding of both core and advanced Java concepts, along with practical applications in building robust, scalable, and efficient applications using Spring Boot. Learn from an **experienced industry trainer** who will guide you through real-world scenarios and best practices, ensuring you gain practical skills that are immediately applicable in the workplace.

Tech Stack To Be Covered



Java



Spring Boot



MY-SQL



POSTMAN



REST API



SWAGGER API

Java Spring Boot

Session 1: Introduction to Java

- **Overview of Java:**
 - History and evolution
 - Features and advantages
 - JVM, JRE, and JDK
- **Setting up the Environment:**
 - Installing JDK
 - Setting up an IDE (IntelliJ IDEA, Eclipse)
 - Writing and running your first Java program
- **Basic Syntax:**
 - Data types, variables, and operators
 - Control flow statements (if-else, switch, loops)
 - Methods and recursion

Session 2: Fundamentals of Design Principles and OOP

- **Design Principles:**
 - DRY, KISS, YAGNI
 - SOLID principles
- **Object-Oriented Programming:**
 - Classes and Objects
 - Inheritance, polymorphism, abstraction, and encapsulation
 - Constructors and initialization blocks
 - Static vs. instance members

Session 3: Exception Handling and Garbage Collection

- **Exception Handling:**
 - Types of exceptions (checked and unchecked)
 - Try-catch-finally block
 - Throw, throws, and custom exceptions
- **Garbage Collection:**
 - How GC works in Java

- Types of garbage collectors
- Best practices for efficient memory management

Session 4: Introduction to J2EE

- **Overview of J2EE:**
 - Architecture and components
 - Role of J2EE in enterprise applications

Session 5: Annotations, Regex, and Design Patterns

- **Annotations:**
 - Built-in annotations
 - Creating custom annotations
 - Use cases in modern frameworks
- **Regular Expressions:**
 - Syntax and patterns
 - Using regex in Java (Pattern and Matcher classes)
- **Design Patterns:**
 - Introduction to design patterns
 - Creational, Structural, and Behavioral patterns
 - Practical examples in Java

Session 6: JDBC

- **Introduction to JDBC:**
 - JDBC architecture
 - Setting up a database (MySQL/PostgreSQL)
- **CRUD Operations:**
 - Connecting to a database
 - Executing queries (Select, Insert, Update, Delete)
 - Handling transactions

Session 7: Java Collections

- **Overview of Collections Framework:**
 - Core interfaces (List, Set, Map, Queue)
 - Common implementations (ArrayList, HashSet, HashMap)

- **Advanced Collections:**

- Comparators and sorting
- Concurrent collections
- Best practices for choosing the right collection

Session 8: File I/O

- **Basics of File I/O:**

- Streams and Readers/Writers
- Reading and writing files

- **Advanced File I/O:**

- Buffered streams
- Serialization and deserialization
- NIO package and file operations

Session 9: Multithreading

- **Introduction to Multithreading:**

- Thread lifecycle and states
- Creating and managing threads

- **Concurrency:**

- Synchronization and locks
- Executors framework
- Common concurrency issues and solutions

Session 10: Introduction to Spring Boot

- **Overview of Spring Framework:**

- Inversion of Control and Dependency Injection
- Introduction to Spring Boot and its advantages

- **Setting up a Spring Boot Project:**

- Using Spring Initializr
- Project structure and configuration

- **Building a Simple REST API:**

- Controllers, Services, and Repositories
- Running and testing the application

Session 11: Introduction to Microservices

- **Microservices Architecture:**
 - Benefits and challenges
 - Comparison with monolithic architecture
- **Building Microservices with Spring Boot:**
 - Creating and managing multiple microservices
 - Communication between microservices (REST, messaging)

Session 12: Spring Cloud Config and Client-Side Load Balancing

- **Spring Cloud Config:**
 - Centralized configuration management
 - Setting up Spring Cloud Config Server and Client
- **Client-Side Load Balancing:**
 - Introduction to Ribbon
 - Configuring and using Ribbon in Spring Boot applications

Session 13: Service Discovery, Circuit Breaker, and Rate Limiting

- **Service Discovery:**
 - Introduction to Eureka
 - Setting up Eureka Server and Client
- **Circuit Breaker:**
 - Introduction to Hystrix/Resilience4j
 - Implementing circuit breakers in microservices
- **Rate Limiting:**
 - Importance of rate limiting
 - Implementing rate limiting using Spring Boot

Session 14: Prompt Engineering with ChatGPT

- **Introduction to AI and ChatGPT:**
 - Basics of natural language processing (NLP)
 - Overview of ChatGPT and its capabilities
- **Prompt Engineering:**
 - Crafting effective prompts
 - Use cases of ChatGPT in software development
- **Integrating ChatGPT with Java Applications:**
 - Using OpenAI API

- Practical examples and best practices