GeeksforGeeks

JAVA

Backend Development

Live

Detailed
Course Syllabus

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Week 1

Session 1: Java OOPS Fundamentals

- Understand the fundamentals of Java OOPS concepts like Objects, Classes, Inheritance, Polymorphism, Abstraction, and Encapsulation
- Learn how to handle exceptions in Java
- Master the Singleton Design Pattern

Session 2: Java 8 Functional Interfaces & Collections

- Learn the differences between Abstract Classes and Interfaces with practical examples
- Explore Functional Interfaces, Lambda Expressions
- Use Generics and Streams to write efficient code
- Work with Java Collections for efficient data management

Week 2

Session 3: Multithreading & HashMap

- Delve into the workings of HashMap
- Understand the concepts of Multithreading, such as Thread creation, Thread Groups, and Thread Join
- Learn to differentiate between Sequential and Parallel Streams for effective task execution

Session 4: Maven for Project Management

- Understand the need for Maven
- Learn to work with POM.xml, explore different Maven Repositories and their types
- Understand the Maven Lifecycle for efficient project management
- Understanding the Need for Gradle and Working with Gradle
- Exploring Gradle's repository management system and its Plugins
- Understand the Gradle Lifecycle Management System
- Maven Vs Gradle

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Week 3

Session 5: Spring Boot Basics

- Learn the basics of Server and Client models
- Introduction to Spring Boot
- How to run the application as a Server
- Understand Embedded Servers like Jetty and Tomcat
- Manage Logging Levels in Spring Boot
- Work with Spring profiles and terminal commands

Session 6: REST API & Spring MVC

- Gain knowledge about REST API, HTTP Requests, and Responses
- Learn to work with POSTMAN and CURL for API testing
- Understand Annotations and Lombok
- Explore the Spring MVC framework

Week 4

Session 7: Spring IOC & Dependency Injection

- Learn about the Spring IOC container, Dependency Injection, and Enums
- Understand the target of an Annotation
- Configure Beans using @Configuration and @Bean annotations

Session 8: Java Database Connectivity (JDBC)

- Understand the differences between In-Memory and Disk Storage
- Learn to connect a Spring Boot application with a Database Server
- Create Request Classes
- Perform validations using JDBC

Week 5

Session 9: JPA & Hibernate

- Understand the need for an abstraction layer between DAO and Database
- Learn about JPA (Java Persistence API), Hibernate, Entity Classes, Annotations, JPA Repository, and ResponseEntity

Session 10: JPQL & Minor Project - Digital Library

- Explore custom queries using JPQL (Java Persistence Query Language)
- Learn about relationships in JPA
- Work on a **Digital Library [Minor Project]**
- Create a project flowchart

Week 6

Session 11: Digital Library [Minor Project] (Continued)

- Continue working on the Digital Library [Minor Project]
- Understand project HLSD
- Data Modelling concepts

Session 12: Unit Testing with JUnit & Mockito

- Learn to change the path of the local repository (.m2)
- Parse CSV files with Spring Boot
- Understand the importance of Unit Testing with JUnit and Mockito

Week 7

Session 13: Redis & Caching

- Get introduced to Redis
- Learn the differences between Cache and Cookie
- Understand Server Cache vs. Browser Cache
- Work with Local Redis Server
- Online Centralized Redis Server for efficient caching

Session 14: Spring Security & Authentication

- Learn about Spring Security and its terminologies
- Perform Basic Authentication using System Generated Credentials
- Understand Authorization with In-Memory
- Database user Authentication

Week 8

Session 15: Digital Library [Minor Project] (Continued)

- Improvement and feature addition for Digital Library [Minor Project]
- Gain insights into project overview, project HLSD, and project Data Modelling

Session 16: OAuth 2 & Github Integration

- Introduction to Oauth2
- OAuth 2.0 concepts
- Learn the workflow of OAuth 2.0
- Explore Scopes and Consent
- Implement Github OAuth2 integration with Spring Boot

Week 9

Session 17: Microservices

- Difference between Monolith Architecture and Microservices Architecture
- Load Balancing Algorithms and Introduction to Eureka Server
- Learn about the Consumers and Producers Model.
- Intercommunication between Microservices using Feign client.

Session 18: Kafka Integration with Microservices and Spring Cloud

- Learn about Message Queues and their types
- Integrate Kafka with Spring Boot
- Introduced to Kafka Message Queue for efficient messaging systems.
- Introduction to Spring Cloud and its configuration & hystrix circuit breaker

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Week 10

Session 19: E-Wallet App like Paytm [Major Project Part 1]

- Start working on an **E-Wallet App like Paytm**
- Project Overview
- Project HLSD
- Project Data Modelling
- Building Microservice Architecture

Session 20: E-Wallet App like Paytm [Major Project Part 2]

- Major Project Continued
- Project Queries
- Career Guidance