

Java Full Stack + Generative AI Developer Program

Master Java, Spring Boot, React, databases, REST APIs, and build AI-powered full-stack applications using Generative AI.

DURATION	SESSIONS	TRAINING HOURS
16 weeks	80 one-hour sessions	80 hours
MODE	LEVEL	INCLUDES
Live online, instructor-led	Beginner to job-ready	16 labs, capstone project

What you will learn

- Core Java programming fundamentals
- Object-Oriented Programming with Java
- Collections, Generics, Exception Handling and Stream API
- SQL and relational database concepts
- JDBC and database connectivity
- Spring Framework and Spring Boot
- Building RESTful APIs
- Hibernate and Spring Data JPA
- Application validation and exception handling
- HTML, CSS and JavaScript fundamentals
- React components, state, hooks and routing
- Integrating React with Spring Boot APIs
- Git and GitHub
- Unit testing and application testing
- Full-stack application architecture
- Generative AI and Large Language Model fundamentals
- Prompt engineering for developers
- Integrating Generative AI APIs with Java applications
- Building AI-powered REST APIs
- Structured AI responses
- AI-powered chat functionality
- Embeddings and vector search fundamentals
- Retrieval-Augmented Generation (RAG) fundamentals
- AI-assisted software development
- Building and deploying an AI-enabled full-stack application

Curriculum

Sixteen modules, one a week, from core Java to Spring Boot, React, deployment and Generative AI. Each week has four concept sessions and a hands-on lab, and the course ends with a full-stack + AI capstone project.

Module 1 Java Foundations

- 1 Java ecosystem: JDK, JVM, JRE, IDE setup and first program
- 2 Variables, data types, operators and type conversion
- 3 Conditional statements and switch expressions
- 4 Loops, debugging basics and coding practice
- 5 Lab: Java fundamentals coding exercises and assessment

Module 2 Methods, Arrays and Strings

- 6 Methods, parameters, return values and method overloading
- 7 Arrays and multidimensional arrays
- 8 Strings, StringBuilder and common string operations
- 9 Packages, access modifiers and coding conventions
- 10 Lab: Problem-solving with methods, arrays and strings

Module 3 Object-Oriented Programming

- 11 Classes, objects, fields and methods
- 12 Constructors, encapsulation and the this keyword
- 13 Inheritance and method overriding
- 14 Polymorphism, abstraction and interfaces
- 15 Lab: Build an object-oriented Java mini application

Module 4 Advanced Java Fundamentals

- 16 Exception handling and custom exceptions
- 17 Collections Framework: List, Set and Map
- 18 Generics, enums and wrapper classes
- 19 Lambda expressions, functional interfaces and Stream API
- 20 Lab: Collections, streams and exception-handling exercises

Module 5 Professional Java Development

- 21 File handling, NIO basics and serialization concepts
- 22 Date and Time API, Optional and utility classes
- 23 Maven project structure and dependency management
- 24 Git and GitHub workflow for Java developers
- 25 Lab: Maven + Git practical and Core Java assessment

Module 6 SQL and Database Programming

- 26 Relational database concepts, tables, keys and normalization
- 27 SQL CRUD operations, filtering, grouping and aggregate functions
- 28 Joins, subqueries, indexes and transactions
- 29 JDBC architecture and database connectivity from Java
- 30 Lab: SQL exercises and JDBC CRUD application

Module 7 Spring and Spring Boot Foundations

- 31 Spring Framework overview, IoC and Dependency Injection
- 32 Spring Boot project structure, configuration and profiles
- 33 Components, services, repositories and layered architecture
- 34 Configuration properties, logging and application lifecycle
- 35 Lab: Build a layered Spring Boot application

Module 8 REST APIs with Spring Boot

- 36 REST principles, HTTP methods, status codes and API design
- 37 Building REST controllers and CRUD APIs
- 38 DTOs, validation and global exception handling
- 39 API documentation, Postman testing and clean API practices
- 40 Lab: Design, build and test a REST API

Module 9 Spring Data JPA and Backend Engineering

- 41 JPA entities, repositories and ORM fundamentals
- 42 Entity relationships: One-to-One, One-to-Many and Many-to-Many
- 43 JPQL, derived queries, pagination and sorting
- 44 Transactions, service-layer design and backend best practices
- 45 Lab: Database-backed Spring Boot REST application

Module 10 Security, Testing and Microservices Basics

- 46 Authentication and authorization concepts
- 47 Spring Security basics and JWT-based authentication
- 48 JUnit, Mockito and unit testing service layers
- 49 Microservices concepts, API communication and configuration basics
- 50 Lab: Secure and test a Spring Boot API

Module 11 Frontend Foundations

- 51 HTML5 structure, forms and semantic HTML
- 52 CSS fundamentals, layouts and responsive design
- 53 JavaScript fundamentals, functions, arrays and objects
- 54 Modern JavaScript: ES6+, modules, promises and async/await
- 55 Lab: Build a responsive JavaScript frontend

Module 12 React Development

- 56 React setup, JSX, components and props
- 57 State management with useState and component lifecycle with useEffect
- 58 Forms, events, conditional rendering and reusable components
- 59 React Router and consuming REST APIs
- 60 Lab: Build a React frontend connected to APIs

Module 13 Full-Stack Integration and Deployment

- 61 Integrating React with Spring Boot REST APIs
- 62 CORS, error handling and end-to-end authentication flow
- 63 Docker fundamentals and containerizing the application
- 64 Deployment concepts, environment configuration and CI/CD overview
- 65 Lab: Deploy a working Java full-stack application

Module 14 Generative AI for Java Developers

- 66 Generative AI, LLMs, tokens, context windows and common use cases
- 67 Prompt engineering: system prompts, user prompts and prompt patterns
- 68 Calling Generative AI APIs from a Spring Boot application
- 69 Spring AI concepts: chat clients, prompt templates and structured output
- 70 Lab: Build an AI-powered Spring Boot REST endpoint

Module 15 RAG and AI-Powered Application Development

- 71 Embeddings and semantic search fundamentals
- 72 Vector databases and document ingestion concepts
- 73 Retrieval-Augmented Generation (RAG) architecture
- 74 Building an AI chatbot over application or document data
- 75 Lab: Build a basic RAG-enabled Java application

Module 16 Capstone Project

- 76 Capstone architecture, requirements and sprint planning
- 77 Full-stack + AI project implementation and code review
- 78 Testing, security review, deployment and project documentation
- 79 Capstone: project presentation, GitHub portfolio and code walkthrough
- 80 Final: capstone demo and technical assessment

How you learn

- Live instructor-led sessions
- Hands-on coding
- Weekly programming exercises
- Practical assignments
- API development exercises
- Frontend and backend integration
- AI integration exercises
- Code reviews
- Real-world development practices
- Capstone project
- Final technical assessment

Who should enrol

- BE / B.Tech students
- BCA / MCA students
- BSc Computer Science / IT students
- Final-year students
- Recent graduates
- Freshers preparing for software development roles
- Students interested in Java Full Stack and Generative AI development

Prerequisites

No professional development experience is required. Basic programming knowledge is helpful, but the course begins with Java fundamentals and progresses gradually toward full-stack and AI application development.

Course completion

Students who complete the training, the weekly labs and the capstone project receive a course completion certificate through GeeksArray, and finish with a deployed full-stack + AI project for their portfolio.

Questions about batch dates, timings, fees or anything else?

Contact the course coordinator, **Kaumodini Kedar** · WhatsApp **+91 91726 23305**

Or see the course page on geeksarray.com.