



COURSE SYLLABUS

Java Full Stack Development Roadmap

A structured 3-month program — from programming fundamentals to Java, SQL, React, Spring Boot, REST APIs and full-stack integration.

12

WEEKS

8

STAGES

5

PROJECTS

1

CAPSTONE

Java

SQL

HTML/CSS/JS

React

Spring Boot

REST APIs

Git & GitHub

- **Beginner-friendly start**
No prior coding experience required
- **Project-based learning**
5 hands-on projects, including a capstone
- **Industry-relevant stack**
The exact tools full-stack teams use today

FINAL CAPABILITY

Build a complete web application using React, Java/Spring Boot, REST APIs and an SQL database.



The 8-Stage Learning Journey

Each stage builds directly on the last, moving from core programming to a complete full-stack skill set.

- | | | |
|---|-------------------------|--|
| 1 | Programming + Java | Write programs and solve basic problems |
| 2 | OOP + Collections | Build structured Java applications |
| 3 | SQL + Database | Store, query and manage application data |
| 4 | HTML + CSS + JavaScript | Build responsive web interfaces |
| 5 | React | Build dynamic frontend applications |
| 6 | Spring Boot + REST | Build Java backend APIs |
| 7 | Full Stack Integration | Connect frontend, backend and database |
| 8 | Projects + Git/GitHub | Build portfolio-ready applications |

FINAL CAPABILITY

By the end of this roadmap, students can build a complete web application using React, Java/Spring Boot, REST APIs and an SQL database – from database design through to a deployed, presentable project.

Three Months, Three Milestones

MONTH 1

Java & Programming Foundations

Core programming, Java basics, OOP, collections.

MONTH 2

Database & Frontend Development

SQL, databases, HTML, CSS, JavaScript foundations.

MONTH 3

React, Spring Boot & Full Stack

React, Spring Boot & REST APIs.

Career-Ready Learning Model

1

LEARN

2

PRACTICE

3

BUILD

4

DEPLOY

5

PRESENT

12 weeks structured path**Concept-first** teaching approach**Deployed** capstone project



MONTH 1

Java & Programming Foundations

Week 1 — Programming Foundations

- Computer & programming fundamentals
- Problem solving & algorithms
- Source code & IDE basics
- Variables & data types

Week 2 — Java Basics

- JDK, JRE and JVM
- Java program structure
- Operators, conditions, loops
- Methods, arrays & basic problems

Week 3 — Object-Oriented Programming

- Classes and objects
- Constructors & methods
- Packages
- Inheritance & polymorphism

Week 4 — Collections & OOP Practice

- List, Set and Map
- ArrayList & LinkedList
- HashSet & HashMap
- Generics & iteration

MONTH 2

Database & Frontend Development

Week 5 — Java & Application Foundations

- Strengthen Java & OOP concepts
- Practical Java exercises
- Prepare for application dev

Week 6 — SQL & Database

- Database fundamentals
- Tables & relationships
- SQL queries
- CRUD operations

Week 7 — Web Fundamentals

- HTML
- CSS
- JavaScript
- HTTP/HTTPS, client-server

Week 8 — HTML, CSS & JS Practice

- Responsive web pages
- Forms & interactive UI
- JavaScript interaction
- Frontend foundation for React

MONTH 3

React, Spring Boot & Full Stack

Week 9 — React Fundamentals

- React application structure
- Components & JSX
- Props and state
- Events & API concepts

Week 10 — React App Development

- Reusable components
- State and hooks
- API calls
- Dynamic frontend apps

Week 11 — Spring Boot & REST APIs

- Spring Boot fundamentals
- Controllers, services, repos
- REST APIs & CRUD ops
- Database integration

Week 12 — Full Stack Integration

- Connect React, Spring Boot, SQL
- Authentication concepts
- Git and GitHub
- Final project & presentation

Tools & Technologies You'll Master

Java

OOP

Collections

SQL

MySQL

HTML5

CSS3

JavaScript

React

Spring Boot

REST APIs

Git & GitHub



Project Roadmap

Hands-on projects reinforce every stage of the curriculum.

MINI 1

Student Management System

Java, OOP, Collections, CRUD

MINI 2

Library Management System

Java, SQL, database operations

FRONTEND

Education Course Portal

HTML, CSS, JavaScript, React

BACKEND

Student REST API

Spring Boot, REST, MySQL

CAPSTONE

Education Algorithm LMS

React + Spring Boot + SQL + auth + progress tracking

What Students Should Be Capable Of

- ✓ Develop applications using Java and apply OOP concepts
- ✓ Use Java Collections and solve programming problems
- ✓ Work with SQL databases and CRUD operations
- ✓ Build responsive web interfaces with HTML, CSS & JavaScript
- ✓ Develop dynamic frontend applications with React
- ✓ Build REST APIs and backend apps using Spring Boot
- ✓ Connect frontend, backend and database into one app
- ✓ Use Git/GitHub; build and present a final project

Note: Completing the syllabus alone does not guarantee job readiness. Consistent coding practice, projects, portfolio work and interview preparation should accompany this roadmap.

Who Should Enroll

1

Absolute Beginners

No prior coding experience needed — the roadmap starts from programming fundamentals.

2

Career Switchers

A structured, job-oriented path into full-stack development within three months.

3

CS Students

Reinforce academic concepts with hands-on projects and a portfolio-ready capstone.

Ready to Start Your Full Stack Journey?

Email support@educationalalgorithm.com

Website educationalalgorithm.com