



Java Full Stack Developer Curriculum with AI/ML Integration

Potential Offerings of this Course

- **High Demand in 2025 Job Market:** Full stack Java developers are in demand, with a 25% increase in job postings (LinkedIn, 2024), driven by Java's enterprise adoption and AI integration.
- **Competitive Salaries:** Earn ₹6,00,000–₹22,00,000 annually in India; global averages of \$80,000–\$130,000 in tech hubs (Glassdoor, 2025).
- **AI/ML Integration:** Build intelligent apps using TensorFlow and Scikit-learn, aligning with the 2025 trend of AI-enhanced web solutions.
- **Cloud-Native Expertise:** Master Spring Boot and Heroku for scalable applications, meeting enterprise cloud demands.
- **Comprehensive Skill Set:** Gain proficiency in React, Spring Boot, MySQL, MongoDB, and CI/CD, preparing for roles in startups and corporations.
- **Hands-On Capstone Project:** Develop a full stack task management app with AI-driven task prioritization, creating a portfolio for employers.
- **Beginner-Friendly Curriculum:** No prior experience needed; learn Java, front-end, back-end, and AI/ML with tools like IntelliJ IDEA and Jupyter Notebooks.
- **Future-Proof Career:** Stay relevant with skills in Progressive Web Apps (PWAs) and cybersecurity, critical for 2025's tech landscape.
- **Flexible Learning:** Designed for students and professionals, using free tools like OpenJDK and Tailwind CSS, spanning 18 weeks.
- **Global Opportunities:** Tap into remote work trends, with Indian developers accessing international roles in web and AI development.

❖ **Phase 1: Programming Fundamentals (Weeks 1-4)**

Learning Outcomes

- ✓ Write clean, efficient Java code using proper syntax and best practices.
- ✓ Implement object-oriented programming (OOP) concepts in Java.
- ✓ Create modular, reusable code with classes and methods.
- ✓ Debug Java programs and manage dependencies with Maven.
- ✓ Use Git and GitHub for version control.

Tools Used

- ✓ Java (OpenJDK)
- ✓ IntelliJ IDEA Community Edition or Eclipse
- ✓ Git and GitHub
- ✓ Command line interface (Terminal/PowerShell)
- ✓ Maven (dependency management)
- ✓ W3Schools, FreeCodeCamp (tutorials)

Project Progress

- ✓ Initialize a GitHub repository for the capstone project.
- ✓ Design Task and User classes for the task management app.
- ✓ Create a static task list interface with HTML/CSS.



❖ **Phase 2: Back-End Development (Weeks 5-7)**

Learning Outcomes

- ✓ Design and build RESTful APIs using Spring Boot.
- ✓ Implement server-side logic and database operations.
- ✓ Create and manage database schemas for relational and NoSQL databases.
- ✓ Deploy back-end applications to cloud platforms.

Tools Used

- ✓ Spring Boot (framework)
- ✓ MySQL Community Edition (relational database)
- ✓ MongoDB Atlas (NoSQL, free tier)
- ✓ Postman (API testing)
- ✓ Spring Data JPA, MongoDB drivers
- ✓ Maven (build tool)
- ✓ Spring Boot Docs, YouTube (Amigoscode)

Project Progress

- ✓ Build REST APIs for task CRUD operations.
- ✓ Persist tasks in MySQL and user preferences in MongoDB.
- ✓ Test APIs using Postman.

❖ **Phase 3: Front-End Development (Weeks 8-10)**

Learning Outcomes

- ✓ Create responsive web pages with HTML5 and CSS3.
- ✓ Implement interactive interfaces with JavaScript and React.
- ✓ Build component-based applications using React.
- ✓ Manage state and handle asynchronous API calls.
- ✓ Consume back-end APIs in front-end applications.

Tools Used

- ✓ HTML5, CSS3, JavaScript (ES6+)
- ✓ React.js (via npm or CDN)
- ✓ Tailwind CSS (free framework)
- ✓ npm (package manager)
- ✓ Chrome/Firefox DevTools
- ✓ React Developer Tools (browser extension)
- ✓ FreeCodeCamp React Tutorial

Project Progress

- ✓ Develop a React front-end for task management.
- ✓ Connect React to Spring Boot APIs using Axios.
- ✓ Style the interface with Tailwind CSS.



❖ **Phase 4: Full Stack Integration and Security (Weeks 11-13)**

Learning Outcomes

- ✓ Connect front-end and back-end into cohesive applications.
- ✓ Implement secure user authentication with JWT and Spring Security.
- ✓ Configure basic CI/CD pipelines for deployment.
- ✓ Optimize applications for performance and scalability.
- ✓ Apply security best practices across the stack.

Tools Used

- ✓ RESTful APIs (Spring Boot)
- ✓ JWT and Spring Security (authentication)
- ✓ GitHub Actions (basic CI/CD)
- ✓ Nginx (web server)
- ✓ Heroku (free tier, deployment)
- ✓ Baeldung (security tutorials)

Project Progress

- ✓ Integrate React front-end with Spring Boot back-end.
- ✓ Add user authentication (login/register) to the app.
- ✓ Set up a basic CI/CD pipeline with GitHub Actions.

Phase 5: AI/ML Fundamentals & Integration (Weeks 14-16)

Learning Outcomes

- ✓ Understand AI/ML concepts (supervised/unsupervised learning).
- ✓ Perform data analysis and visualization with Python.
- ✓ Use pre-trained ML models and build simple classification models.
- ✓ Integrate ML models into web applications via APIs.
- ✓ Display ML predictions in user interfaces.

Tools Used

- ✓ Python (Anaconda), Jupyter Notebooks
- ✓ NumPy, Pandas (data handling)
- ✓ Scikit-learn (ML models)
- ✓ TensorFlow (deep learning)
- ✓ Flask (ML API deployment)
- ✓ Matplotlib (visualizations)
- ✓ Teachable Machine (no-code ML)

Project Progress

- ✓ Prepare a task dataset for ML (e.g., priority, due date).
- ✓ Train a model to classify tasks as urgent/non-urgent.
- ✓ Deploy the ML model as a Flask API and integrate it with Spring Boot.



Phase 6: Capstone Project and Career Preparation (Weeks 17-18)

Learning Outcomes

- ✓ Design, build, and deploy a complete full stack application with AI/ML features.
- ✓ Collaborate using agile methodologies and project management tools.
- ✓ Document code and create technical specifications.
- ✓ Build a portfolio and prepare for technical interviews.

Tools Used

- ✓ All previously introduced tools
- ✓ Trello or GitHub Projects (project management)
- ✓ Figma (free tier, UI/UX design)
- ✓ Markdown (documentation)
- ✓ LeetCode, HackerRank (interview prep)
- ✓ GitHub Pages (portfolio hosting)

Project Progress

- ✓ Finalize the AI-powered task management app.
- ✓ Deploy the app to Heroku.
- ✓ Create a portfolio showcasing the project.
- ✓ Practice coding interviews and present the project.