



# Full Stack Java Bootcamp Syllabus

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**This course begins with an introduction to software development using the Java programming language. After building up core competencies in Java programming, you will apply these skills to build interactive web applications using the open source Spring framework. The final capstone project incorporates an Angular front-end combined with Java back-end services for a well-rounded experience of modern software development. We focus throughout the course on core programming and problem-solving skills that will prepare you for a career as a software developer.**

## **Unit 1: Foundations of Java (Pre-work)**

Independently complete online material and projects to get started with the foundations of programming using the Java programming language and the Eclipse IDE.

## **Unit 2: Core Java**

This unit begins the instructor-led portion of the bootcamp. Work with an instructor, TA, and other students to build on the foundations of creating simple Java programs that can gather and track information, perform calculations, and make decisions. Also, start using Git and GitHub to manage project code. This unit, and all following units, include lectures, readings and videos, hands-on exercises, coding labs, and group projects.

### **Core Skills and Technologies:**

- Java
- Console Input/Output
- Logic, Conditionals, and Loops
- Methods
- Git, GitHub, and the Command Line

## Unit 3: Collections and Exceptions

Organize lists of data in Java and handle errors that may come up. Learn how to fix bugs and verify that your programs will work correctly in various circumstances. Write programs that test themselves for errors using automated testing. Start solving complex coding problems with critical thinking strategies. Consider the tradeoffs between different ways of solving a code challenge.

### Core Skills and Technologies:

- Arrays and Collections
- Handling Errors and Exceptions in Code
- Testing and Debugging Java programs
- Evaluating Algorithms for Efficiency
- Automated (Unit) Testing
- Coding Challenges

## Unit 4: Object-oriented Programming

Object-oriented Programming is a popular paradigm for developing application code, and Java is an object-oriented language. Learn about classes, objects, and inheritance, as well as more advanced object-oriented principles that will help you write high-quality code. Practice technical interviews in order to be ready for the hiring process.

This unit includes a larger group project. Experience working together in a software development team. Practice real-world skills like technical collaboration, source control (with Git), and pair programming.

### Core Skills and Technologies:

- Classes and Inheritance
- Object-oriented Principles: Inheritance, Abstraction, Encapsulation, and Polymorphism
- SOLID Principles
- Data Structures
- Agile Development Essentials

## Unit 5: Database (MySQL)

Databases are used to store and organize small or vast amounts of data for software systems. Get experience with MySQL, a popular relational database system. Learn how to store, manipulate, and analyze data.

### Core Skills and Technologies:

- SQL
- MySQL

## Unit 6: Web Apps with Spring MVC

Apply the Java programming language to the task of creating interactive web sites (i.e. web applications) using Spring Boot and the Spring MVC.

### Core Skills and Technologies:

- HTML
- CSS
- Web Application Development
- Spring Boot
- Spring MVC
- JSP and JSTL

## Unit 7: Spring Data with MySQL

Increase the capabilities of web applications by connecting them to a MySQL database. Learn how to create REST APIs with Spring Boot. REST APIs allow mobile apps and other web applications to plug into your data and Java code.

### Core Skills and Technologies:

- Spring Data
- MySQL
- Creating RESTful JSON APIs with Spring

## Unit 8: Angular

Once you've built a strong foundation in back-end development, we'll turn to the front end to make accessible, robust, and dynamic web applications powered by Angular and TypeScript. These technologies enable the highly-interactive experiences of the modern web.

### Core Skills and Technologies:

- TypeScript
- Document Object Model (DOM)
- Angular
- Single-Page Applications (SPAs)

## Unit 9: Full Stack Angular

Complete fully-featured web applications by connecting a MySQL database, Spring Boot, and Angular together. We will use REST APIs to communicate between Angular and Spring Boot.

### Core Skills and Technologies:

- Angular
- RESTful JSON APIs with Spring
- Full-Stack Application Development

## Final Project

The crown jewel in the Grand Circus bootcamp experience is your final project. By the end of bootcamp, you'll have a portfolio project that you can share with hiring managers and the skills to describe your work. Following an Agile software development process, you'll work in a group to create and deploy a web application using the skills you developed. During your project, you get real-world experience not only with the technical aspects of building an application but with the career skills required to collaborate with a team.



## Core Skills and Technologies:

- Web Application Development
- Spring Boot and Spring MVC
- Spring Data with MySQL
- Creating and Using REST APIs
- Source Control Best Practices (Git and GitHub)
- Agile Software Development
- Collaboration