Springboard

Software Engineering

CAREER TRACK SYLLABUS

2024

Content

Overview

The demand for software engineers is at an all-time high. Companies are constantly seeking developers to build new products and applications that users love from the ground up or improve existing ones. As a result, competition is growing among employers for developers who can build products that are both powerful and easy to use.

The **Springboard Software Engineering Career Track** is designed to teach you job-ready web developer skills using the MERN stack - the most popular stack in web development.

The program covers **full stack web development**, which includes both the "front end" of websites (the part that users see and interact with) and the "back end" (the part that stores and manipulates data). Full stack developers build web-based pages and applications to achieve user, business, and product goals.

By the end of the bootcamp, you'll have a complete programming skill set to succeed in a web development role.

Overview

What You'll Learn

Over the course of 9 months, you'll:

- Gain intermediate proficiency in the most widely used programming language in the world for the web — JavaScript.

- Learn the ins and outs of software development theory, tools, and skills.

- Demonstrate your knowledge of software development through course projects.

- How to leverage AI tools including ChatGPT to code faster and smarter.

- Create an interview-worthy portfolio to show off to potential employers.

How You'll Learn

- **An online curated curriculum** developed by our team of industry professionals and instructional designers: Build your software engineering skills and learn best practices through articles, videos, exercises, and assessments.

- **Project-based learning:** Five portfolio projects covering front-end, back-end, and full-stack development will help you attain proficiency in software engineering.

What You'll Gain

- **1-on-1 mentor support**: You'll be matched with a mentor who will help you tackle the curriculum, provide regular feedback, and answer your questions. Your mentor will keep you accountable and give you an insider's perspective.

- **Career coaching**: You'll work through career-specific units with a career coach guiding you — from defining your strategy, and developing your resume and LinkedIn profile to networking, mock interviews, and salary negotiation.

- **A certificate of completion and Job Guarantee**: You'll graduate with a certificate from Springboard backed by our Job Guarantee — if you don't land a job after graduating, we'll give you a full refund. **Terms apply**.

Key Program Details

9 months
Program length

11-17
Hours per week

7 total projects
6 mini-projects

5 portfolio pieces, including 1 capstone

Prerequisites
- Basic skills in HTML, CSS, and JavaScript

Tools & skills learned

HTML CSS JS MongoDB

SQL NEXT.JS

node JS Redux

React PostgreSQL

Express JS ChatGPT

Syllabus

Each unit covers key aspects of **front-end, back-end, or full-stack web development**, leveraging JavaScript libraries and frameworks for database management, working with APIs, and building interactive User Interfaces.

Syllabus

Introduction to Web Development

1. Understanding Web Development

In this unit, you'll build an understanding of web technologies, fundamental web principles, and get familiar with modern development tools. Learn foundational concepts of web application development and how to apply them using the MERN stack.

Topics Covered:

- The evolution of the web
- Web mechanics
- Introduction to the MERN stack

2. Integrated Development Environment Setup

Your Integrated Development Environment (IDE) is where you'll practice coding and build your projects throughout the course. Visual Studio Code (VS Code) is the highly customizable source-code editor developed by Microsoft that you'll get hands on with.

Topics Covered:

- Installing Visual Studio Code
- HTML and CSS extensions for Visual Studio Code
- JavaScript Extensions for Visual Studio Code

3. Command Line and MERN Stack Tools

As a web developer, you'll use command line operations to customize your development environment, interact with servers and debug applications. In this unit, you'll start working with the command line interface which will give you a deeper understanding of system-level operations and knowledge of how to troubleshoot issues efficiently.

Topics Covered:

- Introduction to Terminal
- Working with Terminal on Mac
- Working with Terminal on Windows
- Installing Homebrew, Node.js, MongoDB and PostgreSQL

4. Git and GitHub

Before starting with any web development, you must build a sound foundation in how to work as a professional developer. In this unit, you'll start using Git and GitHub which are essential for version control, collaborating on projects and code reviews. These will become second nature to you as you delve into trickier units.

Topics Covered:

- Introduction to version control
- Working with Git
- Working with GitHub
- Working with GitHub Desktop
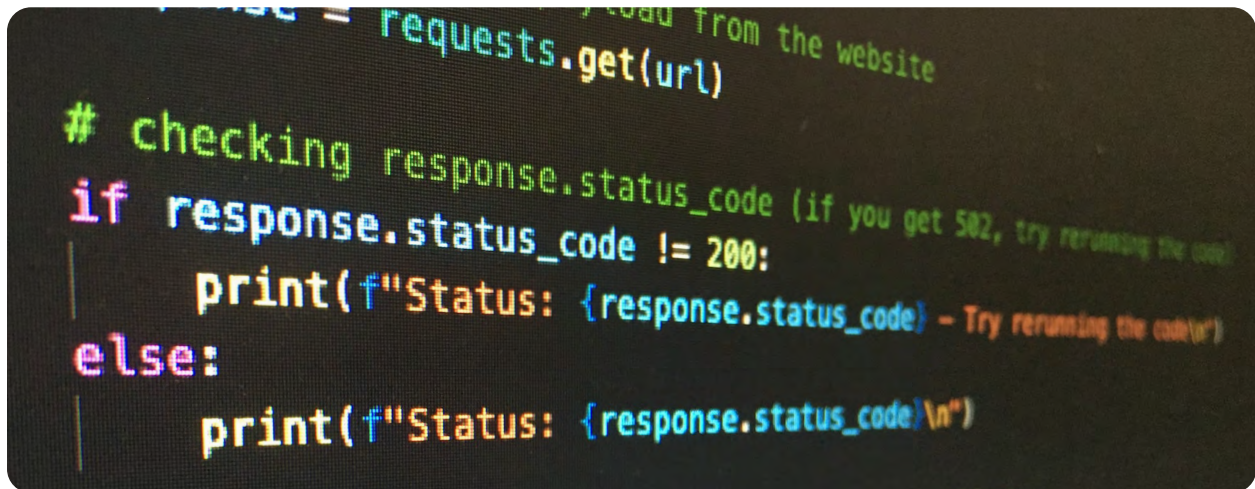
JavaScript for Web Interactions

5. Intermediate JavaScript

In this unit you'll start using JavaScript in all the components of a web application, both frontend and backend. Build your conceptual knowledge and get hands-on experience with JavaScript features that you will use everyday as a web developer.

Topics Covered:

- Error Handling
- Algorithmic Thinking and Problem Solving
- Basic and Advanced Data Structures
- Asynchronous Programming
- Modules
- Object Oriented Programming (OOP)
- ES6+

6. JavaScript and the Web

Take the next step with Javascript and learn how to leverage it with various user facing components of a web application - the front end.

Topics Covered:

- Working with browsers
- Working with Document Object Model (DOM)
- JavaScript events

7. JavaScript and APIs

Continue building your JavaScript skills as you interact with the backend components of a web application. By the end of this unit, you'll understand how the frontend and backend talk to each other and be ready to start building web applications from scratch.

Topics Covered:

- Introduction to HTTP
- Introduction to REST and RESTful APIs
- Introduction to GraphQL
- Introduction to Model-View-Controller (MVC) design pattern

Building MERN Stack Web Apps

8. Building View: React.js

In this unit, you'll work with your first tool in the MERN stack - React. React.js is a JavaScript library that makes creating interactive and dynamic user interfaces (UIs) for your web applications easier with less code.

Topics Covered:

- Introduction to React.js
- JSX and Props
- Building React folder structure and components using Vite
- State management in React
- Building forms and handling user inputs
- Advanced state management with Redux

9. Building Model: Databases

Get hands-on with your second tool in the MERN stack - MongoDB. Build your foundational knowledge of relational databases before learning how to work with MongoDB.

Topics Covered:

- Introduction to databases
- Working with relational databases and SQL
- Working with NoSQL databases

10. Building Controller: Node.js and Express.js

By now you'll understand how the frontend is built using React and the backend with MongoDB using MERN stack. Now it's time to make them compatible through building APIs using Node.js and Express.js.

Topics Covered:

- Introduction to Node.js
- Introduction to Express.js
- Defining routes and handling requests
- Implementing middleware for request processing
- Creating RESTful APIs with Express
- Authentication and authorization

11. MVC Integration with Next.js

This is the unit where everything comes together. Software engineering is not just building applications, but doing so in an effective and efficient manner. Learning CORS, GraphQL, TypeScript and Next.js will help you achieve throughout your career.

Topics Covered:

- Cross-Origin Resource Sharing (CORS) in Node
- Using GraphQL in MERN stack
- TypeScript fundamentals
- Using TypeScript with React
- Integrating frontend and backend with Next.js framework

12: AI for Engineers - Prompt Engineering [OPTIONAL]

Since the arrival of OpenAI's GPT-3, there has been an increased awareness of the crucial role prompts play in shaping language model outputs. In this unit, you'll gain a deep understanding of how language models like GPT-3 and GPT-4 work and explore the relationship between prompts and responses.

Topics Covered:

- Leveraging the power of context, clarity, and specificity in crafting effective prompts
- Using priming and conditioning to guide language model outputs
- Programming code into prompts
- Prompt chaining to create interactive conversations
- Generating structured responses
- Real-world applications of prompt engineering in coding
- Current trends and advancements in prompt engineering
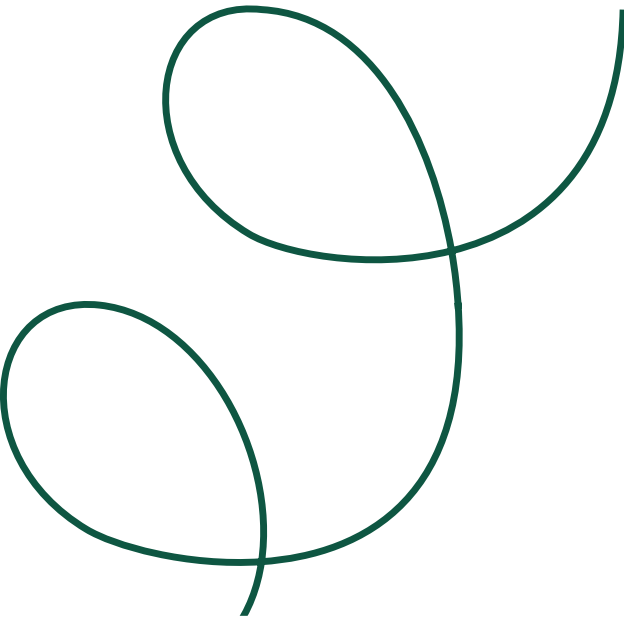
Building Your Portfolio Projects

While working through this program, you will complete five projects to showcase in your programming portfolio, including one capstone project.

These projects are an integral part of the curriculum that will allow you to apply all of the skills you develop while working through the program. You'll gain hands-on experience on building each individual component of the **MVC (Model, View, and Controller)** architectural pattern.

Building Your Portfolio Projects

Jeopardy

Build an app to recreate the jeopardy game using front -end development with JavaScript, HTML and CSS on top of a public API.

Pokedex

Create a Pokémon application with a custom user interface, which is an encyclopedia of various information on Pokémon (a Pokedex).

Space Travel

Build a futuristic app to plan space travels by maintaining and tracking the details of all our spacecrafts using front-end development (View) in MERN Stack with React.

Dog Adoption Platform API

Design and build RESTful APIs for a Dog Adoption Agency applying your back end development (Controller) skills in MERN Stack using Node.js and Express.js

Capstone Project

In this project, whose steps are distributed across the course, you will build a complete web application using MongoDB as the database, Node.js and Express.js for creating the API layer and React.js for building the frontend.

- Step 1: Project Ideas
- Step 2: Project Proposal
- Step 3: Front End Plan
- Step 4: Plan Database Model
- Step 5: API plans
- Step 6, Build, Document and Submit the project for evaluation.

Career Support

Career units throughout the bootcamp will help you create a tailored job search strategy based on your background and goals. Learn to craft a resume that stands out from the pack, evaluate companies and roles, ace interviews, and negotiate the best possible salary.

Your career coach will be with you every step of the way, offering feedback and providing personalized tips based on your goals.

Topics Covered

- Types of industry roles
- Job search strategies
- Building a network and using it to land interviews
- Creating a high-quality resume, linkedin profile, and cover letter
- Preparing for technical and non-technical interviews
- Successful negotiation
- Building a portfolio

Build the Skills and Confidence to Transform Your Career

Learn through projects. Work 1-on-1 with a mentor and career coach.
Land a job or your money back.

HANDS-ON LEARNING

A high quality, project-based curriculum designed by industry experts helps students master their area of study so they're career ready.

REAL HUMAN SUPPORT

Students receive the dedicated support of a personal mentor, career coach, and student advisor, plus 24/7 access to a peer community.

MORE FREEDOM

100% online classrooms give students the flexibility they need to continue working while attending Springboard.

JOB GUARANTEE

Students who are job-qualified will get a job after graduating, or get a full refund of their tuition. **Terms apply**.

Springboard Students Achieve Life-Changing Outcomes

NUMBER OF ENROLLED STUDENTS

2,957

Enrolled students in the Software Engineering Career Track since January 2020. [1]

December 2023

12 MONTH JOB PLACEMENT RATE

88.4%

Of job-qualified individuals who reported an offer, received it within 12 months of graduation. [2]

December 2023

AVERAGE SALARY INCREASE

$25,764

Average salary increase of Software Engineering students who provided pre- and post-course salaries. [3]

December 2023

[1] Number of students refers to all students who enrolled in the career track excluding any that were refunded due to cancelation in the first 7 days following course start.

[2] Job-qualified individuals defined as all graduates who maintained Job Guarantee eligibility (terms are from the Software Engineering Career Track Job Guarantee) throughout their job search ("Job-Qualified Graduates"), or Job Guarantee-eligible students who receive a job regardless of completion status ("Early Offerees").

[3] Data on compensation was not self-reported by 45 students who reported receiving offers.

Ready for the next step?

Learn more and apply **here**

Questions? We're here to help

Email us at **hello@springboard.com**
or call **+1.415.966.2533**

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