RICE UNIVERSITY

CODING BOOT CAMP

CURRICULUM OVERVIEW

The digital revolution has transformed virtually every area of human activity—and you can be part of it as a web development professional. Rice University Coding Boot Camp is a 12-week Full Stack Flex course that gives you the knowledge and skills to build dynamic end-to-end web applications and become a full stack web developer.

The program is rigorous and fast-paced and covers both the theory and application of web development. As you gain proficiency, you'll use what you learn on real projects under the guidance of area practitioners. Plus, you'll have an impressive Professional Portfolio and the confidence to succeed as a web development professional.

Is The Program Right For **You**?

Are you creative, curious and looking to reinvent yourself professionally? If so—or if any of the following describes your situation—enrolling in our coding boot camp could be a smart career move:

You're considering a career change but not sure how to take the first step

You're happy in your current field, but want to move to another company, or stay put but shift from a non-technical into a technical position

You want to engage more deeply with your current job, or boost your earnings and broaden your experience with freelance work

You have an entrepreneurial idea and need to acquire the skills to go "all in" on it and launch your business

You're looking to learn a lot of useful and valuable skills in a short amount of time

The **Skills** You'll Gain

You will graduate with full stack web development skills*, including:

Browser Based Technologies

- HTML5
- CSS
- Responsive Design
- CSS Frameworks (Bootstrap, Materialize)
- JavaScript
- jQuery
- Handlebars
- Cookies, Local Storage
- React.js

Deployment

- Heroku
- Git
- Github Pages

PHP

- Laravel

Databases

- MySQL
- MongoDB

Node.js (Server Side Development)

- Express
- Security and Session Storage
- User Authentication
- MERN Stack (React.js, Express.js, MongoDB, Node.js)

Quality Assurance

- Writing Tests

Computer Science

- Data Structures
- Algorithms

*The materials covered in this course are subject to change due to market demand.

Building
On The Basics

In web development, as in sports, you can't succeed without a solid grounding in the fundamentals. That's why our curriculum begins with a deep dive into the basics of coding and data structure. That said, we recognize the surest way to impress prospective employers and get job offers is to demonstrate your skills on real-world projects. You'll have ample opportunity for hands-on involvement in outside projects, which will make up your Professional Portfolio.

Real Projects, **Real Jobs**

Our graduates have the opportunity to be placed in many different roles, including:

Full Stack Developer	Application Development Manager
Frontend Web Developer	Computer Programmer
Backend Web Developer	Web Designer
Product Manager	Email Developer
Technical Project Manager	Web Producer
QA and Test Engineer	Technical Business Analyst
Software Developer	

What You **Learn**

By the time you graduate, you can expect to be able to:

Apply "social coding" accepted and best practices (including source control, issue tracking, functional feedback, etc.)

Expertly navigate the file system and terminal basics

Build a frontend website either from scratch or by utilizing a frontend framework (such as Bootstrap)

Work independently or in a group on complex projects throughout the entire development lifecycle

Deploy static and dynamic websites to the cloud

Understand the basics of troubleshooting and enhancing legacy code

Implement complex logical conditions to meet an objective

Communicate the basics of serving a webpage and how the browser renders the code

Write SQL commands to perform Create, Read, Update and Delete commands

Create RESTful API's utilizing JSON as a data format

Consume RESTful API's properly utilizing REST verbs

Create a full stack Single Page Application with AJAX communication

Create robust PHP-based websites utilizing Laravel, an MVC framework

Develop your vision for a website—and then build it!

Create session-based applications utilizing user authentication schemes that are well-known and widely used

Course **Structure**

Over the course of 12 weeks, attend informative lectures and take part in a variety of individual and team exercises, working independently and in groups, in the classroom, and at home. Homework assignments provide an opportunity to apply what you've learned and build on it. The goal is to give you a comprehensive learning experience so we model our program after real-world corporate environments. This gives students a true insight into a "day-in-the-life" of a full stack developer.

DISCUSSION	LAB WORK	PORTFOLIO PROJECTS

Instructor-led discussions cover the background, history and use of a new technology or concept.

Put classroom teaching into practice individually and with a team to work on timed in-class exercises and projects.

Your portfolio signals to employers that you are ready for primetime! Build a substantial portfolio of projects that demonstrate your abilities across a wide variety of technologies.

We're Here To **Help**

As you move up the learning curve, you're likely to have questions around some of the concepts covered in class. We're here to help—through in-person and virtual office hours, as well as a dedicated #slack channel where you can get assistance from instructors, support staff and your fellow students. All work is done via Github, so you can create issues directly on your own projects for instructors to assist you in a truly asynchronous fashion. In addition to learning to code, you have access to career services that will help you prepare for technical roles after graduation such as:

Career Content and Practice Sessions

Database of Customizable Tools and Templates
- Multiple Technical Resume Templates
- Github Best Practices
- Guidelines for Building a Portfolio
- Creating an Elevator Pitch
- Developing a Bio

Online Career Events With Industry Professionals

Soft Skills Training

One-on-One Career Coaching

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Professional **Portfolio**

It's a fact: companies care about what you can do, not what you say you can do. For that reason, our curriculum teaches you how to put what you've learned to work on actual portfolio projects, ranging from simple HTML and CSS code samples to sophisticated Single Page Applications with backend databases.
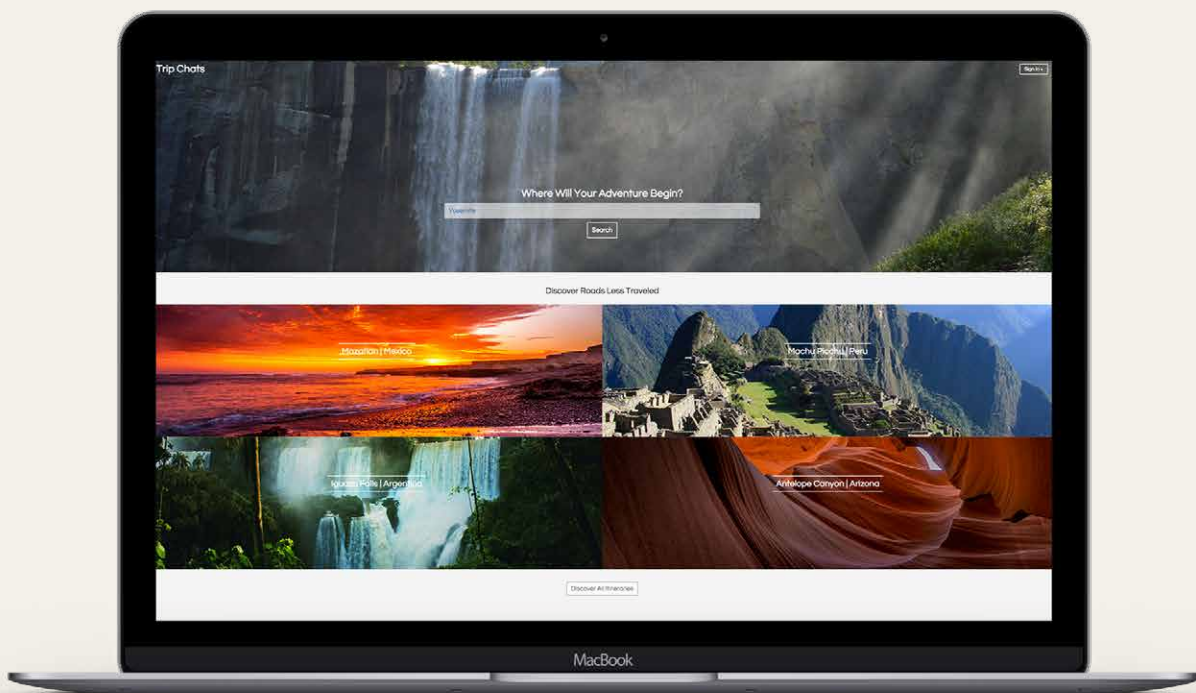
Building Your **Portfolio**

Your Full Stack Portfolio Page

Once you complete our program, your portfolio page helps you showcase your work with links and descriptions to the projects you've created, code samples, and personal information that employers want to see. Think of your portfolio page as your new home on the web.

Skills Needed

- HTML5
- CSS
- JavaScript
- Bootstrap
- Heroku
- Git

Objectives

- Create a home on the web to showcase your skills
- Build a complete site from concept
- Commit code to a shared repository

Javascript Based Game

Building a game has many components, and seemingly simple ones such as keeping track of state or playing over the Internet can be deceptively complex. This game involves components like interface design, state management, edge cases, determining win paths...and, of course, fun! Students also learn intangible skills, such as how to best tackle a difficult problem.

Skills Needed

- HTML5/CSS
- JavaScript/jQuery
- Event and State Management
- Bootstrap

Objectives

- Build a fully functional game
- Track winning and losing stats
- Apply logic skills to a real project
- Understand the basics of iteration

Self-Selected Front End Project

This is a group project that forces you to think outside your comfort zone. You and your group will decide what to build and then build it—a frontend application that interacts with real-world services like Google Maps, Twitter and IMDb API.

Skills Needed

- HTML5/CSS
- JavaScript/jQuery
- API Consumption
- Bootstrap
- Git
- Heroku

Objectives

- Work in a group to build a project together
- Interact with third-party services
- Think in terms of mobile responsive design
- Read/write from/to a remote database

Full Stack Project

In your first full-stack web application you'll create an intuitive frontend/robust backend and scalable database.

Skills Needed

- HTML5/CSS
- Interactivity (AJAX)
- JavaScript/jQuery
- mySQL
- State Management
- Node.js
- Sessions
- Express.js
- Bootstrap
- ORM

Objectives

- Track issue progress with industry standard tools
- Communicate with team members asynchronously
- Design a MySQL Database Schema
- Create a full stack application
- Write project documentation
- Understand database relationships

ReactJS Site

Facebook's ReactJS library allows developers to combine the layout and logic of HTML and JavaScript into a cleaner and more cohesive approach to coding. It's abounding complexities and strict demands make the learning curve steep, but grasping the React paradigm helps you keep your code maintainable while at the same time impressing potential employers.

Skills Needed

- ReactJS
- React Router
- JSX
- Babel
- HTML/CSS
- Bootstrap
- MongoDB
- Git

Objectives

- Building an app powered by the MERN stack: MongoDB, Express, ReactJS and Node
- Creating data-rich React components that you can mix and match throughout your app's pages.
- Incorporating pre-programmed Node packages from the NPM community

Laravel Site

Laravel is huge. It has become the most powerful and most heavily used PHP Framework in the world. This is cutting edge in the PHP world, and you'll be sure to impress employers with what you make with it.

Skills Needed

- HTML5/CSS
- Bootstrap
- Git
- PHP
- Laravel
- MySQL
- React.js

Objectives

- Customizing it based on your group's needs
- Use pagination
- Use open source packages to do a lot in very little time
- Leverage the MVC design pattern with Laravel
- Implement authentication to let users sign into your application

Final Project

Work independently or break out into groups to collaborate on a final project. For this project, come up with your own project and actually build it. The skills you learn during this activity truly help you to prepare for your first interviews and jobs!

Skills Needed

- Everything you've learned!

Objectives

- Define project scope
- Quality Assurance testing
- Responsive Design
- Deployment
- Code Organization

Course **Curriculum** By Module

Module	Description	What You'll Learn
Module 1: Mastering The Browser (Weeks 1-2)	When most people think of the "Internet," their mind immediately conjures up their web browser. We dive into detail about how the browser works and what exactly the source code comprising a web page does.	» Creating a webpage from scratch » Mastering terminal commands » JavaScript and its most beloved child, jQuery
Module 2: API and JSON (Weeks 3-4)	The advent of the API has rapidly propelled the pace of innovation in technology. Being able to communicate with other systems enables you to do even more with yours.	» Consuming RESTful APIs » Parsing JSON to extract meaningful data » Using AJAX to update data on a website without having to hit that "refresh" button in the browser
Module 3: Server Side (Weeks 5-7)	Have you ever wondered how websites originate? They typically come from computer programs called "servers," but did you know that servers do so much more? Interacting with databases and even other servers! Learn how to write back-end JavaScript code with Node.js.	» Writing Node.js server code to serve static web pages » Querying large amounts of data and answering questions from MySQL and MongoDB Databases » Incorporating the Express framework to combine these server-side technologies with client-facing web pages—the full stack begins here
Module 4: Learn to MERN (Weeks 8-9)	PHP started out as a simple language for a personal homepage. It's now a critical part of the Internet as a whole. Here's where we dive in to teach you how it all comes together.	» Deep-dive into Laravel » Use Laravel's built-in tools to build complex applications quickly » Understand how Laravel implements the MVC design pattern
Module 5: PHP (Week 10)	Django is a high-level Python web framework. It is designed to make website creation easy and hassle-free. Django is a technology that allows for "quick builds" and helps developers to complete projects mistake-free.	» Create code for building sites » Deep dive into Django » Understand how the Python framework functions
Module 6: Computer Science Fundamentals (Week 11)	Computer science fundamentals are essential to web development so our curriculum includes a deep dive into the basics of coding and algorithms.	» Applying computer science to JavaScript » Studying which data structures to use for specific problems » Understanding which searching and sorting algorithms are most efficient for particular use cases
Module 7: Final Project (Week 12)	Throughout the course, you've developed an impressive portfolio of projects to show future employers. This final project is all yours. Use all of the technologies you've learned and make something distinctly your own.	» Dreaming up something fantastic and understanding the bounds of reasonable and achievable