

Careers in Code

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Module 0 (Week 0): Welcome to Careers in Code / Orientation

Description

Welcome to the program! Module 0 will be a 1-day event. For the first half, we'll introduce all of the students, instructors, and partners involved in Careers in Code. For the second half, we'll distribute laptops for everyone and get your basic development environment setup. We'll also discuss the learning policy and honor policies. You'll also create any relevant accounts you need to complete the program.

What You'll Learn / Key Objectives

- An introduction to students, instructors, and partners of the program
- Receive a laptop

- Configure a basic development environment
- Understand the learning and honor policies
- Sign up for relevant accounts
 - Github
 - FreeCodeCamp
- Discussion of the curriculum and project milestones
- How to access the course classroom
- Determine coworks memberships
 - Standard
 - Membership
 - Flex hours

Module 1 (Week 1): The Development Big Picture

Description

In the first module, we'll drill home the big picture of development before writing any code. We'll go over things like searching effectively, the different fields of computer science, how the internet works, and an understanding of what a technology stack is and why we are leveraging a full-stack javascript stack. We'll also discuss an introduction to agile to help manage your own work and projects throughout the course.

What You'll Learn / Key Objectives

- Understanding how the internet works
- How to search effectively
- Understanding the different fields of computer science
- Continue setting up your development environment
- A high-level understanding of different technology stacks
- A high-level understanding of the full-stack JavaScript stack (front-end, back-end, databases)
- Understanding agile foundations

Project: Set Up a trello board

Create a trello board to help you start managing your workload and workflow for your projects.

Capstone Idea(s)

Module 2 (Weeks 2 - 3): Web Development Fundamentals

Description

In module 2, we'll dive into lessons and hands on exercises exploring the fundamentals of web development. You'll start to learn the building blocks of the web, HTML, CSS, and Javascript while exploring common

developer tools and troubleshooting/debugging practices. We'll also cover basic unix, git, and ultimately deploy your first simple website.

What You'll Learn / Key Objectives

- Basic HTML, CSS, and Javascript
- Basic UNIX (navigating file structures, configuring environments)
- Basic Git & Github
- Debugging and Troubleshooting techniques
- Familiarity with common developer tools (Chrome dev tools, text editors)
- Basic DOM (Document Object Model)

Project / Blog: Deploy a simple 3-page website

Create a simple website, push it to github, register a domain, and deploy it to a static site generator.

Module 3 (Weeks 4 - 5): Visual Design, Accessibility, Responsive Web Design

Description

In Module 3, we'll continue to improve our HTML and CSS skills. We'll dive into visual design, accessibility, and responsive web design.

What You'll Learn / Key Objectives

- Understand what visual design is and how to apply different techniques (typography, color theory, graphics, animation, page layout)
- Understand and implement accessibility techniques for people with visual, auditory, mobility, or cognitive disabilities (screen readers, alt text, HTML5 semantics, tab indexing)
- Understand responsive web design principles and frameworks (media queries, css flexbox, css grid, preprocessors, bootstrap, foundation, etc)

Project / Blog: Photoshop Document to responsive website

Create a fully-responsive (looks good on all devices, phone, tablet, desktop) single page website from a photoshop document.

Capstone Touchpoint

Module 4 (Weeks 6 - 7 - 8 - 9): Fundamental Programming and Javascript

Description

In Module 4, we'll dive into programming fundamentals using javascript for the first half. Then, we'll dive into functional programming fundamentals and ES6 javascript skills. We'll also explore how to think algorithmically.

What You'll Learn / Key Objectives

- Thinking algorithmically (pseudocode, project design and planning)
- Basic Javascript
- Introduction to programming fundamentals using javascript (algorithms, data structure, objects, arrays, functions, arguments, control flow (if, switch), iterables, variables, scope, object oriented programming, hash tables, stacks, queues, trees, model view controller)
- Introduction to functional programming (closures, context, first-class functions, callbacks)
- Asynchronous Javascript and the [event loop](#)
- ES6 javascript skills (let, var, const, arrow functions, template literals, destructuring, looping, spread, rest, classes, callbacks → promises → async/await, map, reduce, filter)
- High-level overview of transpilers, bundlers, and npm
- Debugging

Project / Blog: Interactive site

Create an interactive site using what you just learned about Javascript. It can be anything you can think of! Maybe a fun game?!

Capstone Touchpoint

Module 5 (Weeks 10 - 11 - 12): HTTP & API's, RestFUL APIs, JSON & Ajax

Description

In Module 6, we learn all about HTTP, requests and responses, consuming RESTFUL API's, parsing JSON, and using Postman.

What You'll Learn / Key Objectives

- Understanding TCP / IP
- Understanding HTTP / HTTP2 and response codes
- Understanding requests / responses, headers, client-server architecture
- Understanding common HTTP verbs (GET, POST, PUT, PATCH)
- Using API's to pull in data and normalizing it
- [Principles of restful design](#) (uniform interface, client-serve, stateless, cachabel, layered, code on demand)
- Using Postman to call API's
- CRUD operations with API's

Project / Blog: Pull in Data using an API

You'll use an API of your choosing to pull in data from at least one source and add some functionality to a website. You could choose weather, TCGplayer's API, open data, or anything you'd like.

Module 6 (Weeks 13 - 14 - 15): Intro to Server-side Javascript with Node.js, Making our own API's

Description

In Module 6, we'll cover an introduction to server-side javascript with Node.js and create our own API using Express.js and consuming the data.

What You'll Learn / Key Objectives

- Core Node.js concepts (npm, package management, node console, serving files and assets, middleware, routing)
- Model View Controller (MVC)
- Introduction to different templating engines
- Exposure to other server-side javascript languages (meteor, sails, restify, graphql (apollo = client, prisma = server))
- CRUD operations with your own API

Project / Blog: Create your own REST API and consume it

You'll create your very own REST API with full CRUD operations and consume it on the front-end. You can create an API on anything you choose!

Capstone Touchpoint

Module 7 (Weeks 16 - 17): Intro to Databases, Data Modeling with SQL and NoSQL

Description

In module 7, we'll build upon what we did in the last module and query a database to start pulling in data into our API we created. We'll learn SQL, noSQL, and how to model data.

What You'll Learn / Key Objectives

- SQL and noSQL and understand the differences and use cases between the two
- Database modeling and ORM (object relational mapping)
 - Sequelize, mongoose
- Introduction to entity relation diagrams (ERD)
- Normalizing data
- Deploy our database to a cloud provider (Mongo, AWS, Azure, mLab, etc)
- Using a DB module with an API model

Project / Blog: Create a database and use it in your REST API

For this project, we'll use a database to get data from our endpoints instead of mock JSON data.

Module 8 (Weeks 18): Infrastructure, Deployment, DevOps

Description

In this module, we'll deploy the app we just created to a cloud provider.

What You'll Learn / Key Objectives

- An overview of the different cloud providers for both hobbyist projects and enterprise development (AWS, GCP/Firebase, Heroku, Digitalocean, Zeit's Now)
- A basic overview of DevOps (Docker / Kubernetes, Continuous Integration tools like Jenkins / CircleCI)

Project / Blog: Deploy your web application

For this project, we'll deploy what we created in the last module to a cloud provider of your choice.

Capstone Touchpoint

Module 9 (Weeks 19 - 20): Testing

Description

In this module, we'll cover how to test your code through unit testing and E2E / regression testing and common tools for doing so.

What You'll Learn / Key Objectives

- Test Driven Development Overview
- Unit Testing (Jest, Mocha, Karma, Enzyme)
- End to End Testing (Protractor, Cypress.io)

Project / Blog: Write tests for your application

For this project, we'll write tests for your web application in the last module.

Module 10 (Weeks 21): Authentication & Authorization

Description

In this module, we'll cover the different ways to authenticate and authorize users on your web application.

What You'll Learn / Key Objectives

- Authentication methods for web application (Cookie, Token, OAuth, SAML)
- Authorizing users in your application (CRUD permissions, auth guards)

Project / Blog: Implement a simple login for your application

For this project, we'll implement a basic login using an authentication method of your choice. If you have time, you can also define permissions for your users.

Capstone Touchpoint

Module 11 (Weeks 22 - 23): Front-end Frameworks Overview, Build Tools, React

Description

In this module, we'll go over a high level overview of different front-end frameworks that exist today and discuss build tools at a high-level. Then, we'll dive into React.

What You'll Learn / Key Objectives

- CSS Frameworks (Bootstrap, Materialize UI)
- High level overview of front-end javascript frameworks (React, Vue, Angular, Ember, State Management (MobX, Redux, Flux))
- Build Tools (Webpack, Parcel)
- Understanding of React fundamentals (JSX, Components, Virtual DOM, state, props, children, pure functions)

Project / Blog: Create a React Application to consume an API

For this project, we'll create a basic react application that consumes an API of your choice, or your REST API you created in the last few modules.

Module 12 (Weeks 24): Capstone work and presentations

Description

In the final module, you'll have time dedicated to work on your capstone and ask your students and instructor for help. The capstone project should encompass a stack of your choosing.

Professional Development

Developing students' skills outside of their technical abilities was an integral piece of Careers in Code.

Networking Events / Local Developer Meetups

Throughout the course of the program, we organized several networking events for our students. We would often dedicate Tuesday's class to attend developer meetups to get involved in the local tech community. Our students interacted with local technologists and helped to improve their communication skills, facilitate connections, and potential employment opportunities.

We think these events helped our students become more confident in their abilities. Additionally, we at Hack Upstate support many local developer meetups [you can read about here](#).

Our students are involved in some of these local meetups and events:

- [OpenHack](#). A casual meetup based around developer side-projects. OpenHack Syracuse happens on the second Tuesday of every month at Syracuse Coworks
- [Syracuse Javascript Meetup](#). Each event has a learning and interactive portion. Whether you're an experienced JavaScript programmer or just getting started, we welcome and encourage all proficiency levels. They meet on the third Tuesday of each month
- [Women in Coding](#). Monthly workshops that give people a chance to work on a project or work through an online curriculum at their own pace. Each workshop will have at least one mentor to provide support and answer questions. Although this group is geared toward women, anyone is welcome to attend our classes
- [Code for Syracuse](#). A group of volunteers that builds digital tools with government and non-profit partners to enhance public life and bridge the digital gap. We're a platform for civic innovation, driven by civic engagement within the Greater Syracuse community.
- Happy Hour upon completion of the program.

We also hosted a professional headshot day on August 14, 2019 where students received photographs from [Von Langen Studios, LLC](#).

After the program, students attended:

- [Google Developer Group Capital Region Devfest](#). Students were exposed to Albany's tech community and learned about machine learning, IoT, Flutter and so on. Our intern, Will Guisbond, also [gave a talk](#) on Careers in Code during this event.
- [Women in Machine Learning and Data Science Events](#). WiMLDS's mission is to support and promote women and gender minorities who are practicing, studying or are interested in the fields of machine learning and data science. We create opportunities for members to engage in technical and professional conversations in a positive, supportive environment by hosting talks by women and gender minority individuals working in data science or machine learning. Events include technical workshops, networking events and hackathons. We are inclusive to anyone who supports our cause regardless of gender identity or technical background.

Some other initiatives our students are involved in after the program:

- [MLH Local Hack Day](#). Organized by graduate Dana McMullen and TA Jennifer Tran, MLH's technology learning day conference is a global conference that allows the community to pick up new skills by experiencing a professional day of learning first-hand. Over the course of the day attendees will participate in a series of workshops where they'll learn skills such as publishing their first website using AWS, sending their first SMS with Twilio, Blockchain, building their first game in Unity and more.
- [Salt City Code](#). A podcast was started by graduates Kelly Corey and Karin Thorne. They talk about their experiences as bootcamp students.

We're excited to find more opportunities to grow student's soft skills through additional events. We'd also plan to host a career fair day and employer roundtable for future cohorts.

Guest Speakers

We hosted guest speakers and invited them to join us before class as well as at our networking events. They shared their experiences working in the industry and provided insight into how students can be successful. More importantly, they inspired students, provided encouragement, and demonstrated what goes into becoming a successful software developer. For our first cohort we were fortunate to be joined by 17 exceptional guest speakers who you can learn more about [here](#).

In the future, we would also like to create more communication and systems to facilitate guest speakers. We found that talks ranging more than 30-45 minutes, while valuable, sometimes did not leave enough time for class content.

Mock Interviews

Raymour and Flannigan contributed several hours from their schedules to conduct mock interviews with all of our students. Matt Checksfield and Ralph Divito joined us on the evening of May 23, 2019 conduct the interviews and gave immensely valuable feedback to our students. Students said *"The feedback from the interview and resume was really helpful! It was amazing for Matt and Ralph to take the time to do this and it's appreciated."* and *"It was VERY helpful as a process and I have a lot to think about and a lot of work to do"*.

Capstone Project

Over the duration of the program, students created an individual capstone project on something they are passionate about. The project was a full-stack (front-end, back-end, database) application that was built throughout the 24 weeks of the program. Students also discussed problems they are solving through touchpoints and demo days. We think the capstone experience was a key part of the program, as it allowed our students to solidify their knowledge throughout the 24 weeks of the program into a real-world project. [You can view the full capstone project requirements here.](#)

During the first week, students chose a project idea that might be of interest to them. Many students worked through multiple iterations. We provided several resources for helping students create their MVP.

Students had several deliverables to complete as part of their capstone project including:

- **Touch points.** The program manager asked each student for a status update, ideas, thoughts, questions, or concerns on their capstone projects. Each student spoke for approximately 2-3 minutes. We think this helped students become comfortable talking about their project and to see where their peers were at.
- **Demo days.** Every ~8 weeks, students plugged in their computers into the projector and share what they've built thus far.
- **Technical blog posts.** We encourage students to write about the progress of their projects through technical blog posts. However, this was a loose requirement.
- **Final presentation.** At the end of the 24 weeks, all of our students presented their final project. This helped boost the confidence of our students and get more comfortable with public speaking. [You can view the presentations here.](#)