Web Development with JavaScript and Node.js - Spring 2013

Course Description

This course is meant to get you going from 0 to 60 with practical software development for the modern web. We will use JavaScript and node.js as a medium to demonstrate and implement some of the more important concepts in web development, and by the end of the semester you will have a website of your very own deployed live for millions to see. In my experience, the best way to learn is by getting your feet wet and building something so that's what we're going to do. The course will touch on topics including http, JavaScript, node.js, asynchronous programming and I/O, REST, Testing, HTML, CSS, NoSQL, client-server model, AngularJS, deployment, and good programming practices. It might seem like a lot at first, but I promise that you will quickly see how they all fit together. By the end of the semester, I aim for each of you to have the knowledge and experience necessary to continue developing for the web with whatever framework or language you choose.

Prerequisites

This course introduces some advanced topics and is programming heavy so it is recommended that student's have taken at least CS1110. However, if you are confident in your abilities and/or have previous web development experience you are welcome.

Course Instructor

Michael Paris – I am a 3rd year Computer Science major who has worked on projects ranging from Android and iPhone apps to Django API's and full HTML web apps built on a variety of technologies. You can see a node.js application of my own at www.michaelparis.us.
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Professor of Contact

If anyone has any issues with the course, grade, or instructor please contact **abhi shelat** – CS Professor and generally cool guy.
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Email: as4bd@virginia.edu

Textbooks

There is no required textbook because really good information can be found online thanks to node's incredibly active community, but for the curious please feel free to check out these great ones:

1. *Node Beginner* by Manuel Kiessling
   (Available online: http://www.nodebeginner.org)
2. *Up and Running with Node*
   (Available online: http://chimera.labs.oreilly.com/books/1234000001808/index.html)
3. *Eloquent JavaScript* By Marijn Haverbeke
   (Available online: http://eloquentjavascript.net)

Grading Policy

30 points – Attendance: show up, learn, have fun, and get free points
30 points – Homework: I know how busy the semester can get so these will be stepping stones to help spread out the work in building your site.
40 points – Final Project: You will create a personal website through the course of the semester that can be a blog, interactive resume, music portal, or whatever else. You will launch this site live for billions of people around the world to see.

Schedule

Week 1

- What is http?
- Introduction to the JavaScript programming language

Homework:

- Install Vagrant and create and account on Github
- Peruse chapters 2,3,4,and 8 in Eloquent JavaScript

Week 2

- Setting up your coding environment
- Linux, the command line, text editors, SSH
- Git and Github

Homework:

- Finish setting up your coding environment
- Write a javascript program computes Fibonacci numbers

Week 3

- Your first webserver and "Hello World!"
- Asynchronous programming and I/O
- What's the deal with node.js?
- Node Beginner Book

Homework:

- Get "Hello World" running and push it to Github

Week 4

- Your webserver continued: routing, middleware, REST
- Node packages and npm
- Heroku

Homework:

- Get your site up on Heroku and link to it in your Github's README
- Familiarize yourself with Express, Passport, and MongoDB

If you want to:

- http verbs in a rest api

Week 5

- Data Persistence
- Introduction to NoSQL with MongoDB
- File storage, Dropbox, Amazon S3
- MEAN

Homework:

- Build user registration and login into your site
- Add MongoDB to your heroku web app and begin making your model

Week 6

- Introduction to HTML and CSS
- The Client-Server model
- Wireframing and Design

Homework:

- Wireframe the frontend of your site

If you want to:

- Sass vs. Less
- Bootstrap, Foundation, Ink, Flat-UI

Week 7

- Introduction to AngularJS
- Responsive Design

Homework:

- Finish the front end design of your site and make it responsive
- (Optionally) Convert your site to an Angular.js application

If you want to:

- Building a web app from scratch with AngularJS
- AngularJS fundamentals in 60-ish minutes

Week 8

- Deployment
- DNS
- Custom Domains
- Fabric
- Heroku

Homework:

- Connect your front end design with your nodejs/express/MongoDB backend to make a blog

Week 9

- Web Security Overview
- Nginx and load balancing
- https, tsl/ssl, oauth, token authentication

Homework:

- Finish your blog and begin adding an additional feature

Week 10

- Time to work on projects, ask questions, and get help

Homework:

- Finish your site (need user login/registration, a blog, and at least one additional (non-trivial) feature)

Week 11

- Project Presentations

Week 12

- Introduction to Django, an alternative approach