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CSC 511: Special Topics in Advanced Web Development (Syllabus)

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College of Staten Island - City University of New York

CSC 511: Special Topics in Advanced Web Development

Instructor: Shane Afsar

Email address: safsar@linkedin.com

Phone Number (text/call for emergencies): 720-273-2451

Classroom Slack (Preferred): <http://csc511.slack.com>

Location: Empire State Building, 3rd Floor, Room - Lampposts

Meeting time: 2-5pm, Fridays

Course Description

This is a project-based course focusing on providing students with applied learning experiences that mirror how web developers operate in a modern professional environment. Students will individually develop a number of web applications leveraging public APIs while learning concepts on accessibility, automated testing, and advancing debugging techniques. Students will learn about Chrome Developer Tools and how to step through an application, audit an application's accessibility, and learn about the tools that people use to access web and mobile applications today, such as Apple VoiceOver, NVDA, and Android TalkBack. Students will also leverage the Ember.js framework to build full applications based on requirements and user stories, and write automated unit, integration, and acceptance tests to verify requirements.

Learning Goals	Assessment Plan
<p>Students will become familiar with the practical aspects of web development, focusing on Accessibility, Testing, and Debugging.</p> <p>Students will be able to</p> <ol style="list-style-type: none">1. Develop and write tests for web applications;2. Understand where and how to look for information and trends in a changing environment;3. Gain additional software development experience and exposure to engineers in the industry.4. Share coursework as a part of their Github portfolio	<p>All individual projects will have required and optional tasks designed to expose students to creating user interfaces that work on both mobile and desktop. Code and project functionality will be reviewed, and each project will have a template where students will be asked to provide time spent, animated walkthroughs, and tasks completed through Github.</p> <p>Students will contribute to each other's individual projects by adding a feature or fixing a bug, allowing evaluation of debugging techniques, exploring unfamiliar code, and helping others.</p>

<p>5. Explore, search, and contribute to unfamiliar code bases</p>	<p>Students will receive guest lectures from current software engineers designed to expose students to the latest techniques and inspire them to explore further. Students will have the opportunity to provide anonymous feedback and connect with guest lecturers.</p>
<p>Students will work in teams of two or three for the final project. The types of team work activities that will be completed by students are:</p> <ol style="list-style-type: none"> 1. creating a project plan 2. developing team based problem-solving and decision-making skills 3. sharing documents, code, and knowledge 4. using Git in a shared team environment 5. communication skills -- preparing and delivering a presentation 	<p>Projects assigned will be done in teams and questionnaires will be given</p> <ol style="list-style-type: none"> a) to assess the amount of work each student did, b) to measure a project team's effectiveness. c) Application of knowledge gained through or beyond previous course materials

PRE-REQUISITES: CSC 225 and CSC 211

Knowledge of HTML, CSS, and JavaScript is highly recommended for this course.

EQUIPMENT: Students will need access to a laptop computer as hands-on development will occur during class hours. CSI will provide loaner laptops if needed or desired.

RESOURCES

- Our main guide will be the Ember.js front-end framework Guides: <https://guides.emberjs.com/release/>
- Projects will be shared on Github, and relevant links, training materials, and project assignments will be sharing during class and in real-time over our classroom Slack. Email will also be used to share materials.
- Other books and resources:
 - <https://developer.mozilla.org/en-US/docs/Web>
 - <https://frontendmasters.com/books/front-end-handbook/2019/>
 - https://www.amazon.com/JavaScript-Good-Parts-Douglas-Crockford/dp/0596517742/ref=sr_1_2

POLICIES / NOTES

- As is the expectation for the workplace, attendance is expected for all class hours. Exceptions must be provided in advance.
- All projects must be handed in on time for full credit.
- Please note CSI's policy on Academic Integrity:
https://www.csi.cuny.edu/sites/default/files/pdf/privacy/cuny_academic_integrity.pdf
- In general -- code sharing is allowed. However, contributions must be specified and cited.
- As a guest in the Empire State Building and LinkedIn office, please be respectful and professional about the environment you're in.
- If you would like to come early or visit on days outside of our regular schedule, please contact Shane.
- If you miss class, it will be your responsibility to find out about what you may have missed.
- You are expected to spend time outside of class to get project work done. Part of the project work will require giving estimates, and providing information about how long it took to complete.

GRADING: The course grade will be calculated based on the following weights:

Attendance & Participation	10%
Individual Projects	45%
Final Team Project	45%

COURSE SCHEDULE (Subject to change)

Week	Topic / Project
1	Introduction with Ember.js overview Project: Tip Calculator Students will learn about the Ember.js framework, and how front-end MVC applications are built to abstract business logic from infrastructure. They will learn about templates, components, routes, models, and services in Ember. Students will learn how to run command line tools and build a tip calculator that captures various requirements.
2-3	Web Application Fundamentals Project: "Rotten Tomatoes" application Students will learn about setting up a robust project structure that can accommodate different screen sizes, leveraging media queries in CSS. They will build adapters and serializers to take in data from an external API, and

	transform the data so that it can be rendered in the browser. They will begin to learn how to use Chrome Developer Tools to step through an application.
4-5	<p>Unit, Integration, and Acceptance Testing Project: “Yelp” application Students will learn how to write data to an endpoint and build on the knowledge from previous projects. Students will learn more about unit, integration, and acceptance testing in depth, the types of issues that can arise with them, and how to work through them: memory leaks, timer leaks, and more. Students will also learn how to contribute to other code by working on each others’ projects, through a pull request for a bug or additional feature.</p>
6-7	<p>Accessibility Project: “Twitter” application Students will learn more about authentication, and how to design an application with multiple users states. Throughout this project, students will learn about NVDA, Apple VoiceOver, and Android Talkback, and walk through their application to demonstrate that it is functional for all users. Students will learn and dive into ARIA roles and common pitfalls that can affect the accessibility of an application. They will also use Chrome Developer Tools to audit the accessibility of their application, and build on previous experience writing tests to ensure their application remains accessible.</p>
8-9	<p>Advanced Debugging + Guest Lecture Project: Team Project While ideating and building their final project in teams, students will learn about advanced animation techniques with CSS, SVG, and Canvas. They will work on understanding Agile methodologies commonly used within teams, and continue to have the opportunity to connect and learn from engineers currently working at LinkedIn with special topics. The final project will test understanding of testing, accessibility, and general application development.</p>
10-11	<p>Animations + Guest Lecture Project: Team Project</p>
12-13	<p>Guest Lecture topics:</p> <ul style="list-style-type: none"> - Building an application at scale - Open Source Development <p>Project: Team Project</p>
14-15	Team Project Presentations