**Syllabus - Web Development - Fall 2021**

Lecturer: Hunter Jorgensen ([ahjorgen167@gmail.com](mailto:ahjorgen167@gmail.com))

Wednesday 6:00pm - 9:00pm PST

Location: Room 402, 225 Terry

TAs:

| Name | Email | Public Github | NEU Github | Responsibility | Office Hour |
| --- | --- | --- | --- | --- | --- |
| Shaun Ho | ho.s@northeastern.edu | shaunhoshenteck | shaunhoshenteck | Lead TA | Tuesday  9:00AM - 11:00AM  [Zoom](https://northeastern.zoom.us/j/9675159824?pwd=NGl6WFl1VEl5cUxDZnBlbThlRzNIQT09) |
| Areal Jones | jones.ar@northeastern.edu | arealjones | arealjones | Discussions | Sunday  2:00PM-4:00PM  [Zoom](https://northeastern.zoom.us/j/8321889569)  (No in-person OH) |
| Bo Niu | niu.bo@northeastern.edu | bo-niu | boniu | Grade submission handling | [Zoom](https://northeastern.zoom.us/j/6173072294)  Thursday  1:00PM - 3:00PM |
| Lukai Lin | lin.luk@northeastern.edu | archliner | lukai | Late days | Monday 1:00 PM - 3:00 PM [Zoom](https://northeastern.zoom.us/j/5591253541) (In-person OH available if needed) |
| Nandish Murugeshi | murugeshi.n@northeastern.edu | nandish291 | nandishmurugeshi | Extra Credit labs | Friday  11:00 AM- 1:00 PM  [Zoom](https://northeastern.zoom.us/j/94812353598?pwd=ZG1RNnpTL3V1MU80TmdmSVk0WHpvUT09)  (No in-person OH) |

Office Hours are also by appointment (email any one of us!)

Online Students: Please contact Hunter directly for information about the online recordings. Recordings are available for all students after class.

**Summary and Objective**

The purpose of this course is to understand core technologies, theories and practices in modern web development. At the end of this course, students should be familiar with broad trends in web development and understand the fundamentals of major technologies that support development practices and also peek at some of the more advanced technologies that affect the most popular websites on the planet. All of this will be reinforced with a series of take home assignments, lectures, in class labs, quizzes, online discussion boards and a final capstone project. The goal of the assignments and projects are aimed to be work that you would be comfortable to show future employers.

The trajectory of this course follows modules that build upon each other. First, we will make simple, static web pages using HTML, CSS and with some considerations on design. Then will start to make websites more interactive by introducing JavaScript and React (a JavaScript library). Once we are comfortable with client facing applications, we will develop a simple backend service using Node.js and Express, exploring how the backend piece interacts with the frontend. Finally, we’ll end the semester understanding both how security (with OAuth and bcrypt) and databases (MongoDB) affect how to build our service. Other topics covered will include MVC, DOM, Redux, HTTP, REST, Sass, and more, time permitting.

This class is mainly geared for students who have no previous experience with web development but have some understanding of programming. If you have lots of experience with things like React, JavaScript and HTML/CSS, you may find this class boring but I am always willing to modify the parameters of the projects to fit your personal interests.

**Development Environment**

As you begin preparing for this course, I recommend setup the following technologies:

* An internet browser (Chrome and Firefox are recommended)
* An IDE or Text Editor ([VS Code](https://code.visualstudio.com/) is the most fully featured IDE for web development; [Sublime](https://www.sublimetext.com/) is recommended for if you prefer something more lightweight; if you have a personal preference, that is fine as well).
* Access to a terminal or command prompt (Linux and Mac have these built in; for Windows, I recommend setting up [Bash for Windows](https://docs.microsoft.com/en-us/windows/wsl/install-win10) and choosing Ubuntu, Fedora or Debian as your Linux Distribution during installation)
* A Github account (you may use a public Github account or the one provided by NEU)
* A way to push code to Git (either with the CLI or the [GUI](https://desktop.github.com/))

**Coursework and Grading**

| **Type** | **Percent** |
| --- | --- |
| Project 1 | 10 |
| Project 2 | 20 |
| Project 3 | 20 |
| Quizzes | 15 |
| Discussions | 10 |
| Participation | 5 |
| Mini Assignments | 20 |

Your final grade will be determined through several different factors: assignments, quizzes, discussions, participation and a final project.

*Projects:*

There will be 3 projects in this class that will allow students to practice and gain experience with different parts of web development technologies. Project 1 can be done solo; project 2 and 3 may be done with one partner, but can be completed alone. The goal of each project is to provide you the opportunity to build something with the technology of the course AND have something demonstrable that you can show to employers. Many of the projects are based off of interviews that I have seen in the wild. Each project should take you about a week of effort.

Note: This class completely supports the opportunity for students to learn subjects that they find valuable to them. In this way, I am open to you swapping one technology for another (i.e. using Vue.js instead of React) or changing the result of the project (i.e., turning a game into a different game or into an app with a similar amount of complexity). However, you MUST discuss this with the teaching staff before project submission so that we can ensure that the work is providing a worthwhile and meaningful challenge.

*Mini Assignments (MA)*:

There are many mini assignments throughout the semester. The purpose of these assignments is to provide a low stakes space to try out some of the technology of the course and to get familiar with this technology: you can think of it like a trial run for the projects. Each mini assignment should only take you a couple of hours (i.e., no more than a single day.)

*Quizzes:*

There will be 3 quizzes in this course. Quizzes will be online and open book (i.e. - open internet), and are always timed. These quizzes will reinforce learnings and allow students to ensure that they completely grasp the material. The goal of the quiz is to simulate a slightly higher pressure environment similar as to what you would face in a job interview.

*Discussions and Responses*

[Schedule and Details](https://docs.google.com/document/d/1CTEDfUGbP14faDeGRphes17l0J0s61nxNfT4uEbaz_k/edit?usp=sharing)

Over the course of the semester, students will be asked to write 2 in-depth posts on modern web development, and 9 responses (not including your introduction.) Links to duplicate sources will be given half credit and any late submission will also be given half credit.

*Participation and Bonus Points*

It is important that students develop the confidence and knowledge to express their ideas and thoughts, though every student may do this differently. During class, there will be labs that allow students to experiment with technologies: if students participate during this section, this may help boost their assignment and quiz scores. Please know that scores can not go above 100%.

*Schedule*

Note that the schedule is flexible, but I’ll keep this up to date as best as possible. Topics may shift or move depending on challenges or interest, but the list below is always the source of truth.

[NEU Academic Calendar](https://registrar.northeastern.edu/wp-content/uploads/sites/9/2021-2022-GR-Expanded-Calendar-List.pdf)

| **Wk** | **Day** | **Topic** | **Work Due** | **Class Links** |
| --- | --- | --- | --- | --- |
| 1 | Sep 8 | Mod 1 (Web Dev Basics) - [Introduction](https://docs.google.com/presentation/d/1Vf-AEKu_Gd_lL55_4_aW2942VAmMb7kY0Q5xpYFwFlI/edit?usp=sharing), [Basic Concepts](https://docs.google.com/presentation/d/1vdXSbbPN6l4sc_84VPz4vruSeMQW5zhjr8ULwXEXopA/edit?usp=sharing), [HTML](https://docs.google.com/presentation/d/1VzOToJRzw_NorH4O2Sf56en8cqMANGukou6ASsEGRDM/edit?usp=sharing) |  |  |
| 2 | Sep 15 | Mod 1 - [HTML Review](https://docs.google.com/presentation/d/13vEDG7KceUvCV8Y3bHKZVmoPZ0gvCDphTpVvRLWPR2Y/edit?usp=sharing), [CSS](https://docs.google.com/presentation/d/1Cy9nvW-So6U0PgHdBxrIwzuAVsHG5Vnpt7H05Rm-3F8/edit?usp=sharing) | MA 1: Introductions Due Before Class | [HTML Class Code](https://gist.github.com/ahjorgen167/3ac44ec54064c6ade1d319ef78b08a5a) |
| 3 | Sep 22 | Mod 1 - [CSS Review](https://docs.google.com/presentation/d/1QLRiZjU8VSx_KZCiur6RhKVMK1h4AlO0VAZ95MI2nJ4/edit?usp=sharing), [Github Pages](https://docs.google.com/presentation/d/13ZXie3_NZxiSgSzKDybDpH92us0UIr-28zZ-0QJbd4Q/edit?usp=sharing), [Flex/Grid](https://docs.google.com/presentation/d/1owvthkfx159PhTPCbuUxuNah1Jjm26ROpH5lvyYtqgQ/edit?usp=sharing), [Mobile Design](https://docs.google.com/presentation/d/1HJtQqO0Ieibjarqg6bd8665iZD1wd85dz91oD_f89qo/edit?usp=sharing) | [MA 2: HTML](https://docs.google.com/document/d/1cAvmAFLQLeiRb-iXXCCTJQ0Dg1bb7AS3CJ_WXdAgMzg/edit?usp=sharing) Due Before Class |  |
| 4 | Sep 29 | Mod 1 - [Design](https://docs.google.com/presentation/d/1Nd2hX4_wpo_RjrG5HeX9ebrMimaq0PpeY3uVqInNoj8/edit?usp=sharing), CSS/HTML Review | [MA3: CSS](https://docs.google.com/document/d/1wX2PaV4mnG8amNyHgxgIUA1_n2xihYMfM8D6AU5lMGQ/edit?usp=sharing) Due Before Class; **Quiz 1** |  |
| 5 | Oct 6 | Mod 2 (Frontend Logic) - [JavaScript](https://docs.google.com/presentation/d/1kLH4OATJeEJG9tycjDTdBhLF5w78xTEoYxm1VSZ42UM/edit?usp=sharing), [DOM/Web Components](https://docs.google.com/presentation/d/1hOQMM4TiuSh_nXOEPSlb4TryXtoX-MTw-5QeB8WrYhU/edit?usp=sharing), Bootstrap | [Project 1: Personal Website](https://docs.google.com/document/d/1VYWT7BBnsRsGtTAguzrm4CNGiuq--yVxVFuDygUPglQ/edit?usp=sharing) Due Before Class |  |
|  | Oct 13 | **Class To Be Rescheduled** |  |  |
| 6 | Oct 20 | Mod 2 - [JavaScript Review](https://docs.google.com/presentation/d/1jHOMeFdPQ_RBxQRSxeC9536LAhokk3vjV2QPlAw9m18/edit?usp=sharing), [Advanced JavaScript](https://docs.google.com/presentation/d/1frhFTUwI85mp7BI5zZGGeib9cR-p31gMw66bcq0v7co/edit?usp=sharing), [Node Setup](https://docs.google.com/presentation/d/19ZP4EFh46PhWmE00-ZpAXD8qmnqJYO33iXXUE_V6aVE/edit?usp=sharing), [React/Hooks](https://docs.google.com/presentation/d/16vZCxB2RQeDSQH5Q_nmfdfTe_wQmwUlY8MVquyYR77A/edit?usp=sharing) | [MA4: JavaScript](https://docs.google.com/document/d/1VbyJjC5AaRm77KhH9RuEiB4cDau771TJlB_Jm7qixVQ/edit?usp=sharing) Due Before Class | [React Code](https://github.com/ahjorgen167/cs5610_fall2021_mod2/tree/react-only/src) |
| 7 | Oct 27 | Mod 2 - [React/Hooks](https://docs.google.com/presentation/d/16vZCxB2RQeDSQH5Q_nmfdfTe_wQmwUlY8MVquyYR77A/edit?usp=sharing) (continued), [React Review](https://docs.google.com/presentation/d/1B4bNTSSxzAdjxmht0SD3KTJl7-j57PvjLEPjthENAsk/edit?usp=sharing), [Redux](https://docs.google.com/presentation/d/1_gnhj37BAfp2JAzJSeImx4AbML-piTgcIeqtXSnHzcY/edit?usp=sharing) |  | [Redux Code](https://github.com/ahjorgen167/cs5610_fall2021_mod2) |
| 8 | Nov 3 | Mod 2 - [Redux Review](https://docs.google.com/presentation/d/1ZPl1YVkqv4t181BLfAPyvf3mvCSB3QaoPowI2xMTRDw/edit?usp=sharing), [Heroku Setup](https://docs.google.com/presentation/d/15cN9CnYV7-Yd_CKI67yAGuehB4Yc9fKFBRRP35sOwy8/edit?usp=sharing), [React Router](https://docs.google.com/presentation/d/1kk5eb_J2VGl5O1ZKh_TABpParIVEX_KvY80mWu7c4oQ/edit?usp=sharing), [Hooks](https://docs.google.com/presentation/d/16vZCxB2RQeDSQH5Q_nmfdfTe_wQmwUlY8MVquyYR77A/edit?usp=sharing), [Class Components](https://docs.google.com/presentation/d/1cnfATIbX7UkvMQOCrSOu3I7wq6naO21SGmmzOiyxmA8/edit?usp=sharing), JavaScript/React/Redux Quiz Review | [MA5: React](https://docs.google.com/document/d/1vrEORaflQaiACZKCoJBrH8m2MaKaSTHCXfa6JzM89Ck/edit?usp=sharing) Due Before Class |  |
| 9 | Nov 10 | Mod 2 - JavaScript/React Review  **\*Online Optional\*** | **Quiz 2** |  |
| 10 | Nov 17 | Mod 3 - [API Concepts](https://docs.google.com/presentation/d/11_L6XFvx1mzfvluEba7K8squ4hJdvpkNxLrmuxK6sLw/edit?usp=sharing), [Introduction to Node](https://docs.google.com/presentation/d/1QN4SMYbqaGe7LFVqw1oh1godY9xMDuiJUwg8lLxR0zw/edit?usp=sharing), [Introduction to Axios](https://docs.google.com/presentation/d/1EKmwGwCZvYu3XG9qsG_x6qnp--VdeJlqNP3Qkcc9hJ4/edit?usp=sharing) | [Project 2: Battleship](https://docs.google.com/document/d/12aL7KkmRlUoLUzKeqA0FCUbzwX4HN1ukl3x4F9L0MZU/edit?usp=sharing) Due Before Class | [First Fullstack App](https://github.com/ahjorgen167/hunter_fall2021_cs5610_mod3) |
|  | Nov 21 | Mod 3 - *Makeup Class 1:45-4:45pm* - Review API concepts, [Fullstack App](https://docs.google.com/presentation/d/1idCNjacPzEr9VVKVQX-vpC5KUUAHJpNamb-crAUKl_E/edit?usp=sharing), [MongoDB](https://docs.google.com/presentation/d/1xdq60almZUxX3V0R8eDq7ztjWNEomVDTloGffJDYpxM/edit?usp=sharing)  **\*Online Optional\*** |  | [Project 2 Hint](https://gist.github.com/ahjorgen167/70c11e784e83feeaa406364f85e7e877), [Mongo DB Atlas Instruction](https://docs.google.com/document/d/1f89LolZA_DpbhNltEyLxQnOscqCcBEnYXWuymIc2w_s/edit?usp=sharing) |
|  | Nov 24 | **Thanksgiving Break - No Class** |  |  |
| 11 | Dec 1 | Mod 3 - Mongo Review, [Deploying to Heroku](https://docs.google.com/presentation/d/1wdCjG_2qBp0ZZlj8-EN3UXqGzJTVt3jBaVVtcEiZLek/edit?usp=sharing), [Authorization](https://docs.google.com/presentation/d/1JCyZjpEL6iH00KNhtivxyiQH5QTsQFzicwQJ9MbcRcc/edit?usp=sharing), [Encryption](https://docs.google.com/presentation/d/1EBh4h57okuCplEUYdRmYYexxZzrslsuTPMZLQJD9ono/edit?usp=sharing), [Browser Storage](https://docs.google.com/presentation/d/1q9L7N8Lquk6sBh9xPNtOqzylPoOJSZ2PHIO2Jo7r5hg/edit?usp=sharing) | [MA7: Pokemon API](https://docs.google.com/document/d/1pndxoiRjGud-ZjL1jlPgpk5PalUSrkJuOzdraObf63Y/edit?usp=sharing) (no MA6, sorry!) Due Before Class |  |
| 12 | Dec 8 | Mod 3 - Full Stack Development Review  **\*Online Optional\*** | **Quiz 3** |  |
| 13 | Dec 13 | Finals Week - No Class | [Project 3: Job Board](https://docs.google.com/document/d/1PxknzaqQeL0srRh7QPTdx5dgGXK6K18ExFvZhETOQJo/edit?usp=sharing) Due By Midnight Dec 15 | [First Fullstack App](https://github.com/ahjorgen167/hunter_fall2021_cs5610_mod3) |
|  | *Dec 20* | *Final Grades Due to NEU Before 6am* |  |  |

**Late Policy**

All the coursework in this class has a slightly different late policy, so please read this section carefully. Obviously, if there is some extreme emergency (accident, family issue, etc.) we can revisit these policies on a case-by-case basis but that will require contacting the lecturer or the TA’s as soon as possible.

For *projects/mini assignments*, every student has 10 late days that may be used without question, each giving you another 24 hours. Late days need to be requested BEFORE the assignment is due. If you are working in a group for certain assignments, everyone will need to use one of their late days to be granted additional time. For assignments that are late and late days are not used, students will lose 5 points per day.

For *quizzes*, you will have to reschedule with the TA or lecturer the time to take the quiz before the start of the next class.

For *discussions*, if you are unable to write a post, then you need to contact another student and switch weeks with them. Late discussion posts and responses are worth half credit.

Special Lecture Topics:

Given time, we may dive into some additional and interesting ideas: Sockets, PHP, GraphQL, Angular, Vue.js, D3, Meter.js, Python/Flask, TypeScript, Server-side rendering, Web Worker, SASS, nginx, Web Assembly, etc.

**Tips for Success**

This course covers a wide variety of topics and ideas, so that even the strongest students may struggle. That said, I have noticed some trends that define the most successful students:

* Make sure to complete all discussions on time. This is often the cause of many lost points!
* Ensure that by the end of the semester the instructors know your name. We are happy to help debug, run test interviews, review resumes or just talk, but you need to initiate it. This is a big way we determine your participation grade.
* If you are stuck, spend only a bit of time (an hour or so) debugging and then come to the instructional staff. A day spent on a single bug, is a wasted day.
* Try to get in the habit of reading log and error outputs. Sometimes they don’t help at all, but most of the time they can be useful. Look for filenames that come from your code

**Resources**

Reading on HTML/CSS/JavaScript: <https://developer.mozilla.org/en-US/docs/Web>

Documentation for React: <https://reactjs.org/docs/getting-started.html>

NodeJS: <https://nodejs.org/en/docs/>

Mongoose Documentation: <https://mongoosejs.com/docs/guide.html>

MongoDB: <https://docs.mongodb.com/manual/introduction/>

**Academic Integrity**

This course has no patience for any kind of cheating, fraudulence, etc. While collaboration is allowed, if you are copying or stealing another student’s assignment (from this or previous semesters) you will be reported to OSCCR. If you suspect that another student is copying or stealing, you should report that to the lecturer immediately.

Please note that I will be using TurnItIn to check code for plagiarism, which compares your code not only against the code you write yourself but also against the code published elsewhere on the internet.