CS 5610: Web Development

Graduate Course, Khoury College of Computer Sciences
Northeastern University, Bay Area Campuses
Fall 2023 Semester

Class Hours:	Thursdays 2-5:20PM PST
Class Location:	San Francisco 20C San Jose 1010
Instructor:	John Alexis Guerra Gomez jguerra@northeastern.edu

1. Objectives and Course Description

This course offers the fundamentals for understanding modern web development. At the end of this course students should be able to build modern web applications using cutting edge technologies. They should also have developed strong understanding of modern web architectures as well as knowing the history of where they came from. Students should also learn basic skills of web design, accessibility and security.

During the semester students will study and prepare asynchronous materials covering basic concepts of web development and web technologies. Classes will be used then to reinforce those concepts, for discussions and for covering advanced concepts.

1.1 Course Prerequisites

None

2 Proposed Schedule

This schedule could be adjusted during the semester depending on the student's progress on the course concepts.

- W1 09/7 Th
  Introduction
- W2 09/14 Th
  HTML5
  CSS
  Bootstrap.js

- W3 09/21 Th
  Project 1 due
  JavaScript
  Node.js
- W4 09/28 Th
  Node
  Express
- W5 10/11 Th
  Mongo
  Forms
- W6 10/18 Th
  Project 2 Due
- W7 10/25 Th
  React
- W8 11/01 Th
  React
  Passport
- W9 11/08 Th
  React
- W10 11/15 Th
  Project 3 due
  Web design
- W11 11/22 Th (Thanksgiving week)
  Web design
  Web Accessibility
  Usability
- W12 11/29 Th
  APIs?
  Security?
  Dataviz principles?
- W13 12/06 Th
  Amazon S3?
  Gatsby / Static Sites?
  GraphQL? PWAs?
  Desktop Apps?
  Web Sockets?
  Testing?
- W14 12/13 Th **Final Project Due**

The last classes are left with questions marks as they are propositions for students to choose based on their interests.

3 Course Assessment

- Participation (20%): 10% Tweets + 10% Lottery points
- Projects (60%)

- Mid-term (20%)

Considerations

- Participation will be computed as the average of your tweets and lottery grades.
- Your tweets and lottery grade will be computed with reference to the class median. If you have the same or more points than the class median, you will get [100%, 110%]. If you have less, you will get [-100% , 100%) proportionally
- Tweets and lottery will be computed on a [-100%, 110%] interval, so your grade can be negative.

3.1 Late/Makeup Policy

- The late penalty is 5% off for each day or fraction of a day that you are late

3.2 Bonus points

The professor might adjust any of the grade categories by providing bonus points or other mechanisms to offer students chances to catch up with points. This might be handled as a courtesy, to compensate for minor mistakes in the TAs grading or other situations. However, policies might apply for each one of these bonuses, for example they might be lost in case a regrading is necessary. These bonuses and their policies would be advertised on Slack.

3.3 Pre-class Work

Before every class, students must tweet something they learned from the readings with the hashtag **#WebDev** and the handle **@NortheasternCA**. The comments should be original, shouldn't repeat what was said before, and demonstrate the proficiency of the required reading.

These tweets are going to considered for the class participation grade. Each comment will be rated as follows:

2 points: An interesting and original comment
1 point: An interesting comment but that was mentioned before by another student
0 points: A non-interesting comment
-1 points: Didn’t tweet or tweet not valid

3.3 Participation

You are required pay attention and to participate actively in the class. For this the professor would use among other techniques a lottery that randomly selects a student to ask them a question. The points would be assigned at the professor’s discretion, but most of the time would be:

-1 points: The student wasn’t in class or wasn’t paying attention
0 points: Wrong answer
1 point: Regular answer
2 points: Great answer

For computing the participation grades, the median of the number of points of the class will be used. Students' grades would be proportional to their difference to the median, i.e. if the student is on the median it will obtain 100%, if it is below less than 100%.

3.5 Grade Calculations

Grades will be calculated on an absolute basis: there will be no overall curving. A weighted average will be calculated according to the percentages attributed to each assessment method listed in section 3.1. The mapping of the weighted average to letter grades is given below. Please note that these grade boundaries may move slightly at the discretion of the instructor, but the grade boundary for A is unlikely to change.

93.00–100.00	A
90.00–92.99	A-
86.00–89.99	B+
82.00–85.99	B
77.00–81.99	B-
73.00–76.99	C+
69.00–72.99	C
65.00–68.99	C-
0.00–59.99	F

4 Course Materials

Our main communication channel will be Slack https://web-dev-neu.slack.com. I recommend you downloading Slack on your computer and your phone and turning on notifications. Students are encouraged to use slack to ask questions, coordinate their work and collaborate.

Some guidelines:

Use #**general** for general issues, questions etc.
Use #**project** for proposing projects and requesting approval. All projects must be approved by the teacher.
Only the teaching assistants and the professor should create threads on #**announcements**. This channel is used for major announcements.
Use #**random** for sharing random stuff.
Use #**classchat** for the class conversation.

There is also an associated Canvas site for this course. We will use it to help keep track of the deadlines. Please make sure to submit both to canvas and the class submission form.

4.1 Textbook and reading materials

Web development is a very quickly changing field, and therefore most printed materials tend to get obsolete very fast. Luckily, the very same reason that defines the pace of change of the field can be used as a constantly evolving learning result: the fact that the developing community is constantly releasing new versions of libraries, frameworks and technologies related for full stack development. Leveraging this, on this course students will be required to complete a list of online readings and resources that can be found on the class website https://johnguerra.co/classes/webDevelopment_fall_2023/.

This list of resources is an evolving compendium that changes as quickly as the field itself. Students are required to make their best effort to select and choose which ones to complete based on their own previous experience. Furthermore, students are invited to report and contribute to it.

4.2 Technologies

Our main programming languages for the class will be EcmaScript (JavaScript), HTML5 and CSS3. The class will also cover other technologies such as Node, React and Mongo among others. It is fundamental that students setup their working computers with a good IDE (Integrated Development Environment), with support for linting tools, i.e. Eslint and Prettier. Visual studio code and sublime are recommended. The following video explains how to configure sublime with the recommended tools:

https://www.youtube.com/watch?v=Q5bbPEAOwYs

4.3 Handing in Assignments

Students will submit their homeworks and projects using canvas and the class submission form found on the class website. We will also be using Github and Youtube for the projects. For each project will need to create video demonstrations and presentations apart from a well-documented Github Project published under the MIT License. More of this will be explained as we move forward during the semester. The instructor can modify elements of this process.

5 General Policies

5.1 Attendance

Students are expected to attend classes regularly, take tests, and submit assignments and other work at the times specified by the instructor.
Students who are absent repeatedly from class will be evaluated by faculty responsible for the course to ascertain their ability to achieve the course objectives and to continue in the course.
Instructors may include, as part of the semester's grades, marks for the quality and quantity of the student's participation in class.

5.2 Academic Integrity

- This class has very strict standards for borrowing code: if you borrow anything for use in your project, you must have a reference.
- A good guideline is that if you take more than three lines of code from some source, you must include the information on where it came from.
- A URL or a notation (e.g., “MATLAB help files”) is fine.
- If it is an entire function, note it at the beginning of the code segment and include any original credit information.
- Provide a qualitative description of what you used, and what you changed/contributed.

Here are a few examples of academic dishonesty:

- Working with one or more partners on an assignment that is to be completed individually.
- Submitting a copy of work done by another student, with or without their knowledge.
- Submitting work that was primarily found on the web or provided by someone else outside of this class.
- Submitting work by anybody who took this course in the past whether the course was here at Northeastern or at another campus or institution.
- Providing or receiving significant help to another student on an assignment.

If you have a question about what is considered a violation of this policy, **please ask!**

Unless stated otherwise (e.g., group project), assignments reflect individual work.

- While you may discuss concepts and ideas with other students, there is to be no direct collaboration.

- If you steal someone else's work, you fail the class.
- If someone uses your work, you fail the class.

If you are unsure about this policy, **ask the instructor**.

The university's academic integrity policy discusses actions regarded as violations and consequences for students http://www.northeastern.edu/osccr/academic-integrity.

5.3 Reasonable Accommodations

One goal of instructors is that every student should be able to participate in this course. If you require any special accommodations, let me know immediately so that we can work out appropriate arrangements.

5.4 Student Feedback

Your opinions are very important to me. Teaching is my passion, and I'm always looking for ways to improve it. Please let me know if you can think of a better way of teaching you.

All students are strongly encouraged to use the TRACE (Teacher Rating and Course Evaluation) system https://www.northeastern.edu/trace/ near the end of the course to evaluate this course. A reminder about TRACE should arrive via email about two weeks before the end of the course. In addition, I will be asking for your feedback at least once about halfway through the semester. However, if you have concerns about the course, don't wait until you are asked. You can contact me any time!

5.5 Classroom Environment

- To create and preserve a classroom atmosphere that optimizes teaching and learning, all participants share a responsibility in creating a civil and non-disruptive forum for the discussion of ideas.
- Students are expected to conduct themselves at all times in a manner that does not disrupt teaching or learning.
- Your comments to others should be constructive and free from harassing statements.
- You are encouraged to disagree with other students and the instructor, but such disagreements need to respectful and be based upon facts and documentation (rather than prejudices and personalities).
- The instructor reserves the right to interrupt conversations that deviate from these expectations.
- Repeated unprofessional or disrespectful conduct may result in a lower grade or more severe consequences.
- Part of the learning process in this course is respectful engagement of ideas with others.

5.6 Title IX

Title IX of the USA Education Amendments of 1972 protects individuals from sex or gender-based discrimination, including discrimination based on gender-identity, in educational programs and activities that receive federal financial assistance.

Northeastern's Title IX Policy prohibits Prohibited Offenses, which are defined as sexual harassment, sexual assault, relationship or domestic violence, and stalking. The Title IX Policy applies to the entire community, including male, female, transgender students, faculty and staff.

Faculty members are considered "responsible employees" at Northeastern University, meaning they are required to report all allegations of sex or gender-based discrimination to the Title IX Coordinator.

The university offers confidential resources for medical treatment, emotional support and counseling through Confidential Employees. Confidential Employees are not required to disclose information about Prohibited Offenses to the Title IX Coordinator without prior consent of the student. Confidential Resources on campus include University Health and Counseling Services (UHCS) staff, Sexual Violence Resource Center (SVRC), Office of Prevention and Education and the Center for Spiritual Dialogue and Service (CSDS). [From Title IV Policy, Section III.C]

Alleged violations can be reported to the Title IX Coordinator within The Office for University Equity and Compliance at: titleix@northeastern.edu and/or through NUPD (844) 688-6287.
Reporting Prohibited Offenses to NUPD does NOT commit the victim/affected party to future legal action.

In case of an emergency, please call 911.

Please visit The Office for University Equity and Compliance for the full Title IX Policy, a complete list of reporting options and resources both on- and off-campus.

5.7 Students with disabilities

Students with disabilities who wish to receive academic services and/or accommodations should visit the Disability Resource Center or call (844) 688-6287.

If you have already done so, please provide your letter from the DRC to the instructor early in the semester to arrange those accommodations.

5.7 Generative AI tools

Generative AI tools such as ChatGPT, Bard and Mid-journey have been creating significant buzz in the media, with some calling it the end of classical programming education. As a way of following a more scientific approach, in this class we will try to use these tools to complement the teaching of the class concepts. Students are welcomed to use generative AI tools in any of the components of the class as long as they:

- Explicitly disclosed that they are using the tool, explaining specifically which tool, version, and what prompts were used.
- Understand that Large Language Models LLMs don't really understand what they are outputting. Therefore, shouldn't be trusted.
- Understand that LLMs are trained to output results that seem to be generated by humans, hence they relate more to a very clever parrot than an oracle.
- Understand the privacy risks of using Generative AI tools.
- Exercise extreme caution.
- Share their learnings with the class.