COMP 426: Modern Web Programming

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Bulletin Description

Developing applications for the World Wide Web with a primary emphasis on client-side programming, Model-View-Controller architecture, AJAX, and RESTful Web services.

THIS COURSE IS REMOTE AND ASYNCHRONOUS

Course Description

Web applications and the underlying technology that supports them have changed very rapidly over the course of the last three decades of mainstream adoption and use of the Internet. It seems like every other year new web standards, languages, platforms, and frameworks come into vogue and take over the development landscape, for a time. In this course we will cover some ways to weave together different basic web technologies to construct HTML5 web applications. We will closely focus on JavaScript as a functional language with a prototype-based object model: namely, 1) how JavaScript treats functions as first-class data types and, 2) how currently-favored JavaScript frameworks are enabled. We will also incorporate practical considerations such as workflows, design implications, and technological debt into our discussions throughout the semester.

This course is driven by and about building things, namely, web applications. The content of the course will focus on a series of assignments meant to get you comfortable with using a variety of tools to build things. Abstract and conceptual material will be introduced as it relates to constructing and developing web applications.

Course Objectives

After completion of the course, students should be able to:

- Construct a client-side interactive web application interface using JavaScript and jQuery.
- Programmatically manipulate the Document Object Model

- Use CSS to effectively render a web application interface according to reasonable design principles.
- Employ functional programming techniques for asynchronous event handling including anonymous functions and closures.
- Design objects using the JavaScript prototype-based object model.
- Use AJAX to implement client-server interactions through a RESTful interface.

Target Audience

This course is intended for computer science majors and minors, information science majors, and motivated non-majors with programming experience.

Prerequisites

COMP 401 and 410; or COMP 211 and COMP 301

Resources

There are no required textbooks for this course. Students will be pointed to a number of online resources. All assignments and material will be posted on our course website.

Communication

This term we will be using Piazza for class discussion. The system is designed to get you help fast and efficiently from classmates, the TAs and LAs, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza.

Find our class signup link at: https://piazza.com/unc/fall2021/comp426

Scheduling office hour will be done through Course.Care: https://course.care/course/61

You will submit your assignments through GitHub Classroom. Invite links for each assignment will be provided on Sakai and Piazza

We will also use Sakai to house the syllabus and a variety of other course content as needed. Sakai will also be a place where you may access grade information.

Course Policies

This course is highly self-directed. This does not mean that you are alone in it without interacting with other students.

New recorded lectures and other course content updates will released sometime on Thursdays, typically, but this is arbitrary. Tuesdays will be reserved for occasional live interactive sessions starting at 15:30. These live sessions are entirely voluntary and intended to facilitate some more direct interaction as a group.

We will facilitate discussions about course content on Piazza. Participating in discussions on Piazza is not mandatory but your experience of the course and what you take away from it will be considerably better if you. Piazza will also be the primary channel for students communicating with the instructional staff. Posting your questions there, rather than emailing the instructor, the TAs, or the LAs means that you will get a much faster and more comprehensive response. Email is discouraged for communication about the course content or logistics.

In the first few weeks of the class, the instructor will send out a poll. You are required to respond to the poll. The purpose of this poll will be for the instructional staff to better understand your backgrounds, interests, skills, and desiderata for the course. It will also be used to help us assign students to teams for collaborating on the final project.

Think of the course like a rudimentary corporation.

You will each be on a team, learning on your own and bringing skills back to your collaborative project.

Your team will report to your assigned LA, who will help triage and field questions about course logistics and content. Again, you will communicate through Piazza so that we will be able to collectively help you much more efficiently and thoughtfully than via email. Your assigned LA will liase with the TAs and instructor to help us better help you in completing your work for the course.

Exams

The midterm exam will be held online. Date and locus of exam system TBD.

The final exam will be an online self-evaluation of your final project and associated documentation.

Assignments

There are no due dates associated with the assignments. You can complete them at your own pace. It's best to try to keep up with them instead of waiting and being overwhelmed toward the end of the course. Part of what we are attempting to develop in this course is healthy work habits and workflow management skills.

The final assignment is a project that will be carried out with a small team over the course of the second half of the semester. You will collaboratively build and document a web app that interfaces with an existing API.

Important Dates

- 2021-08-18 FDOC
- 2021-08-19 First effective day of this class
- 2021-10-19 Midterm
- 2021-10-21 Fall Break
- 2021-11-25 Thanksgiving Recess
- 2021-12-01 LDOC
- 2021-12-04 Final exam (16:00)

Honor Code

Working with other students on assignments is strictly prohibited All student work submitted to fulfill assignments must be original work, creditable in its entirety to the student submitting it.

In addition to the assignments, COMP 426 also requires a term project.
Students will work in teams of five on a collaboratively designed and developed web application as their term project. Students are expected to bring their own ideas and work into the term

project. The product at the end of the term project must be the result of each student's original contribution.

Be careful that you do not submit any code that you did not personally write in any part of the deliverables for this class. "Original contribution" means that the code did not exist somewhere else before you typed it into a text editor. Submitting code copied from others or from the internet may result in your submission being flagged by the system for plagiarism.

Collaboration or use of any unauthorized resources on the midterm is, of course, a violation of the Honor Code.

Title IX Resources

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community.
Please contact the Director of Title IX Compliance (Adrienne Allison – Adrienne.allison@unc.edu), Report and Response Coordinators in the Equal Opportunity and Compliance Office (reportandresponse@unc.edu), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators (gvsc@unc.edu; confidential) to discuss your specific needs. Additional resources are available at safe.unc.edu.

Accessibility Resources

The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in barriers to fully accessing University courses, programs and activities.

Accommodations are determined through the Office of Accessibility. Resources and Service (ARS) for individuals with documented qualifying disabilities in accordance with applicable state and federal laws.
See the ARS Website for contact information: https://ars.unc.edu or email ars@unc.edu.

Counseling and Psychological Services (CAPS)

CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs.
Go to their website: https://caps.unc.edu/ or visit their facilities on the third floor of the Campus Health Services building for a walk-in evaluation to learn more.

Dinosaur

Please post a picture of a dinosaur to the followup discussion on the Dinosaur post (under "other") in Piazza once you have read the syllabus. No this is not a joke.

Disclaimer

The instructor reserves to right to make changes to the syllabus, including any project due dates, test dates, or other aspects of the schedule.
Any changes will be announced as early as possible on Piazza.

Proposed Schedule

The course is broken into modules that are relevant to your assignments and projects.

The course is asynchronous, so you may work faster through the modules if you wish once the content for a given module is released.

The schedule below is a draft and is subject to change, contingent on mitigating circumstances and the progress we make as a class.

Students are encouraged to check Piazza for regular updates and communications from the instructional staff.

00: Introduction

01: HTML5 and CSS3 Crash Course

02: JavaScript Basics

03: JavaScript Not-so-basics

- JavaScript Functions, Variable Scoping, and Closures
- Prototype-based objects, duck typing

04: DOM

05: jQuery and HTTP

06: Event Handling

07: Advance Functions / Closures

08: Cookies / Session State

09: RESTful Web Interfaces

10: AJAX / JSON

11: Security / Authentication

12: Same-Origin Policy / CORS

13: Third-party APIs

14: React