

CSCI 571: Web Technologies

Spring 2021

Overview

The 'blurb' for the course states this: 'Advanced study of programming languages with application to the Web. Languages for client-side and server-side processing. Examples taken from: HTML, Java, JavaScript, Perl, XML and others.'

This course is about the 'web' - it will help you understand how it works, and also teach you how to write software (both 'front end' and 'back end') that runs on it.

We will start at the foundational level, and cover the basics of HTTP, web servers, clients, etc. We will then progress to discussing responsive web design (for mobile devices), programming frameworks, server-side programming etc. We will finish, with discussions related to modern practices - latest APIs, serverless applications, microservices, etc.

In addition to regular lecture and discussions, you will also be provided, ongoing, with 'extra' material that can help you make connections between course material and the real world (eg. the 'G-MAFIA + BAT' group of 'Big Nine' companies, and many others).

Pre-requisites

You DO need to know coding, period! The assignments are all code-related, and the lecture material will include code samples and code-oriented demos throughout. Specifically, the languages you'll be programming in, are

- JavaScript
- Python
- Java (for Android development) **or** Swift (for iOS development)

We'll cover the basics of these languages, esp. JavaScript and Python. That said, prior knowledge of them will be quite helpful for you.

Topics

Here are topics from fall 2020 - for spring, we will cover almost the same ones, with possible additions mentioned below.

- The Internet, WWW basics, history
- HTML
- style sheets
- JavaScript: basics
- JSON
- server-side scripting, using Python
- DOM
- forms, CGI
- web servers
- JavaScript: advanced
- HTTP
- web services
- AJAX
- 'RWD'
- JavaScript frameworks
- jQuery
- high performance websites
- React
- mobile development: Android, iOS
- serverless functions, applications
- cookies, privacy
- web security

In addition, the following topics are expected to be covered at least in passing (an existing topic or two would be swapped out for these):

- Web Assembly ('wasm')
- the Rust programming language
- JavaScript Promises, async/await etc.
- Deno ["deno deno deno..." :)]
- Elasticsearch, Solr, Lucene
- Shadow DOM
- communicating with databases

- containerized microservices
- more application containers: Firebase, Heroku, Netlify...

There is/are no formal textbook(s) for this class.

As we progress through the course, there might be content (PDFs, links to sites, etc) that will be made available to you, to serve as reference or background knowledge.

Course structure

This term, the course will be entirely online/remote. Lectures will be streamed via WebEx, be recorded, and posted on DEN/D2L. You'll submit HWs via D2L. Exams will be online, too. We will make heavy use of Piazza, to communicate with each other throughout.

The course will have **four** assignments, including a final project; there will also be several ungraded ones throughout, meant to help you get set up with coding environments. Assignments are to be completed individually [no collaboration allowed!]. There will be **two** exams: a midterm exam and a final.

The following weightage scheme will be used in determining letter grades for the course at the end of the term:

- assignments: 50% (10% + 10% + 15% + 15%)
- exams: 50% (25% + 25%)

Questions?

Do feel free to ask: saty@usc.edu.
