CSCI 571: Web Technologies

Term: Spring 2026
Units: 4

Lecture: Tue, Thu 5:30-7:20pm, SGM 124 (30378)
Tue, Thu 5:30-7:20pm, DEN@Viterbi (30016)
The lectures will also be on Zoom and D2L Brightspace for DEN students only.

Instructor: Marco Papa, Ph.D.
Office: Ginsburg Hall 302E
Office Hours: Thursday 1:00-5:00pm
Contact Info: papa@usc.edu

Teaching Assistant: Pourebadi Khotbesara, Masoume
Contact Info: pourebad@usc.edu

Teaching Assistant: Huang, Run
Contact Info: runhuang@usc.edu

Teaching Assistant: Qin, Yuehan
Contact Info: yuehanqi@usc.edu

Course Producers: Listed in D2L Brightspace and Piazza

Catalog Description

Study of client-side and server-side Web programming languages, including HTML, CSS, JavaScript, Python, Java, Kotlin. Vibe coding with IDEs, AI Assistants and LLMs.

Course Description

This course focuses on the World Wide Web. Its focus is to present many of the core technologies that the Web is based upon. These core technologies include:

- HTML (Hypertext Markup Language) and CSS (Cascading Style Sheets)
- HTTP (Hypertext Transfer Protocol) 1.1/2/3
- Web servers, their configuration and performance properties
- Client-side Programming using JavaScript
- Ajax (Asynchronous JavaScript & XML) and JSON (JavaScript Object Notation)
- Server-side Programming using Python and JavaScript

In addition, the course will also cover the following subsidiary topics:

- Web Services (REST)
- Web Security and Privacy Tools
- Web Technologies for Mobile Phones (Android and iOS)
- Responsive Website Design
- Cloud Computing (Google Cloud)
- Angular, React and Node.js
- Serverless Applications, Microservices, Containers
- AWS Lambda, Google Cloud Functions, and Azure Functions
- Diceware, TOR, and the Dark Web
- Cloud/REST access to NoSQL databases (MongoDB Atlas)
- HTML5 New technologies and APIs
- IDEs, AI Tools, and LLMs for “vibe coding.”

The course is recommended for students with deep knowledge of at least two programming languages (JavaScript, Java, Python, C#, C++).

Learning Objectives

Course Outcomes. By the end of the semester, you will be able to:

i	Write RESTful API applications;
ii	Set up Cloud services;
iii	Design and code back-end scripts in Python and JavaScript;
iv	Design and code front-end Web Applications;
v	Design and code Mobile Apps in Java/Kotlin;
vi	Design and code web front-end asynchronous applications using AJAX;
vii	Design and code responsive web apps;
viii	Write front-end programs using JavaScript;
ix	Design graphical user interfaces using HTML and CSS;
x	Read Web Services API documentation and use it in building Web applications;
xi	Write Microservices and Containers.
xii	Use a NOSQL database like MongoDB Atlas
xiii	Use IDEs, AI Tools and LLMs to “vibe code.”

Students completing this course will have the ability to:

1	Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

2	Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements.
3	Communicate effectively in a variety of professional contexts.
4	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

Prerequisite(s): None.

Course Notes

D2L Brightspace will be used for hosting the course materials (slides and homework assignments) and grades. D2L Brightspace will be used by students for uploading completed assignments and taking exams.

In-person and Online Lectures

Lectures will be held live, in-person, and on Zoom exclusively for DEN-enrolled students. Zoom meeting link will be available on D2L Brightspace. Recorded lectures will be made available exclusively to DEN students.

Technological Proficiency and Hardware/Software Required

We will be using HTML, CSS, JavaScript, and Python in this class. Those pieces of software are available for free and will run on macOS, Windows and Linux. For "vibe coding" we will be using a variety of IDEs, AI assistants and LLMs. **Students are required to have a laptop**, running Windows, macOS or Linux, for exams. Laptops are available, for 4 hours at a time, through the USC Computing Center Laptop Loaner Program. USC Technology Support Links: Zoom information for students, D2L Brightspace.

Required Readings and Supplementary Materials

The course does not use any textbook.

Description and Assessment of Assignments

The course includes 3 individual assignments. Assignment #1 covers a web front-end SPA, using HTML, CSS and JavaScript, accessing a single REST API. Assignment #2 adds a cloud back-end, written in Python/Flask, providing multiple REST APIs aggregation, server-side API proxying, and configuration management. Assignment #3, the Final Project, adds Responsive Design, frameworks and libraries, multi-API orchestration, server-side and client-side pagination, debouncing, performance optimization, and changes the cloud back-end to NodeJS/Express. Each assignment is deployed on Google Cloud and serves to measure student performance on at least one or more learning objectives.

Process Log Policy: all assignments require a process log (10% of score). AI users: submit prompts and fixes. Non-AI users: describe your coding process. Missing logs get 0/10." This is fair and encourages reflection.

Participation

No credit is provided for participation.

Grading Breakdown

Assessment	% of Grade
Assignments (1-2)	12
Written Exam #1	40
Written Exam #2	40
Final Project	8
TOTAL	100%

Grading Scale

Grades are not curved but based on proficiency with the material. Ranges operates in favor of the students. At the end of the semester, if the average in the class is lower than 80%, the average will become the cut-off between a B- and a C+. Final scores will be rounded up.

x >= 93	A	73 <= x < 77	C
90 <= x < 93	A-	70 <= x < 73	C-
87 <= x < 90	B+	67 <= x < 70	D+
83 <= x < 87	B	63 <= x < 67	D
80 <= x < 83	B-	60 <= x < 63	D-
77 <= x < 80	C+	x < 60	F

Assignments Weights

Assignments and Final Project have different maximum points and weights, contributing to 20% of the total score.

Assignment	Maximum Points	Weight
#1	10	20%
#2	15	40%
#3 - Final Project	15	40%
TOTAL	50	100%

Assignment Submission Policy

Assignments will be discussed in class and worked on individually. Discussion among students is fine, but no copying of other student's code is allowed. Assignment 1 is ungraded but needs to run on GitHub Pages. Assignments 2 and 3 need to run online on Google Cloud, and grading will only occur if the web applications are able to run online. Assignments running on "localhost" will not be acceptable. The last "mobile" assignment, the final comprehensive project, will be submitted by video during final week. Assignments source code and links to the online web apps will be submitted to D2L Brightspace (instructions will be provided in class and on Piazza) and are due by 11:59p.m. on the due date (see Late Policy below). Grading criteria will be provided with the assignment description. Graders will grade the assignments. All grades will be posted to D2L Brightspace gradebook.

Grading Timeline

Assignments will typically be graded within 7 days of the due date. Exams are usually auto graded by D2L Brightspace Quiz Tool.

Course Specific Policy - Regrading

Once grades are entered into D2L Brightspace gradebook, students will be able to request a regrade if they think a mistake has been made by the grader through the following process:

1. Once an assignment is graded, an online form will be provided on Piazza, to submit a formal regarding request. Note that this is the only request that can be made to regrade that specific assignment, so be sure to include all relevant information. Requests will not be able to be submitted after more than 2 days after the form is posted, as the form will be closed.
2. The TA will review the request and determine if a regrade will be granted.
    a. If the regrade request is denied, the original grade will stand.
    b. If the regrade request is granted, the TA will forward the request to a grader (possibly a different one than who originally graded it). The grader will conduct a regrade and send the updated score to the TA, who will then enter it, with feedback, into D2L Brightspace.

3. There will be **only one regrade request per assignment**, using an online form, which may include regrade of multiple items, and the score after the regrade is final. If any questions arise beyond that, the student will need to speak with the professor in person.
4. There is no regrade of the final comprehensive project, due on Final Week.

Course Specific Policy - Late Policy

Each student will have **two (2) grace days** to use during the semester for submitting assignments late. Grace days can only be used on *assignments* (**not** final project, exams, etc.), and the days can be used in any combination. For example, you could use one grace day on assignment 1 and one grace day on assignment 2. All submissions other than for assignments in accordance with this policy must be submitted by 11:59p.m. on the due date or will receive a 0.

After the two grace days have been used, any assignment submitted late will receive a 0. A grace day will be counted for any assignment submitted after 11:59p.m. on the due date. To state that another way, if an assignment is submitted after the due date, at 12:00a.m. (midnight) or later, grace days will be used. The grace days do not need to be approved by the professor, but any exceptions other than grace days will need professor approval. In exceptional circumstances, late submissions will be accepted, with a 30% penalty.

Attendance

There is no lecture attendance requirement that counts towards your grade in the class. However, students who do not attend the lectures are responsible for all material covered in the lectures. The course uses the Piazza online forum platform to efficiently simulate and manage class discussions. Discussions are limited to course materials, assignments, and exams. Following all postings on Piazza is also required.

Exams

Exam #1	Tuesday, February 24, 2026.	5:30p.m. (40 min)
Exam #2	Thursday, April 30, 2026.	5:30p.m. (40 min)

The written exams consist of theoretical questions and may include code to be analyzed. No code will be required to be written. All exams are in-person, using the **D2L Brightspace Quiz Tool**. Access to the classroom to take the exams will be provided only after having your student USC ID scanned by smartphone and its ID number verified and checked against a spreadsheet of the roster. The LockDown Browser may be used in exams.

An exam can only be taken on the scheduled date and at the scheduled starting time. Accommodations for students with letters from OSAS will be provided, though the exam will still need to be taken on the scheduled date and start time, unless a specific accommodation has been granted by OSAS, and approved by the instructor. There are no makeup exams. If you miss an exam due to an emergency, official written documentation, whatever that may be based on the situation, will need to be submitted to me as soon as you are physically able (before the exam if possible). Approval will be solely based on my discretion though it should be based on a documented illness or emergency. Based on the exam, here are the rules that will be followed:

- If an excuse is not approved, you will be given a 0 on the exam.
- If there is an approved excuse for written exam #1, the percentage for that exam will be added to the percentage for written exam #2.
- If there is an approved excuse for written exam #2, you will receive an Incomplete grade in the course and must make up the exam based on the conditions of an Incomplete.

Academic Integrity

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the USC Student Handbook. All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Please ask me if you are unsure about what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Collaboration. In this class, you are expected to submit work that demonstrates your individual mastery of the course concepts.

Group work. Unless specifically designated as a 'group project,' all assignments are expected to be completed individually.

Accordingly, all assignments #1 through #4 are individual assignments.

Computer programs. Plagiarism includes the submission of code written by, or otherwise obtained from someone else, including a source like ChatGPT.

If found responsible for an academic violation, students may be assigned university outcomes, such as suspension or expulsion from the university, and grade penalties, such as a zero on the assignment, exam, and/or "F" in the course.

Use of Generative AI in this Course

Generative AI is encouraged: You are expected to use AI (e.g., AI Assistants like GitHub Copilot and LLMs like GPT-5) in this class. Learning to use AI is an emerging skill; this is an opportunity for you to discuss with the instructor appropriate use of these tools. Keep in mind the following:

- AI tools are permitted to help you brainstorm topics or revise work you have already written.
- If you provide minimum-effort prompts, you will get low-quality results. You will need to refine your prompts to get good outcomes. "Vibe coding" with IDEs, AI Assistants and LLMs is recommended.
- Proceed with caution when using AI tools and do not assume the information provided is accurate or trustworthy If it gives you a number or fact: assume it is incorrect unless you either know the correct answer or can verify its accuracy with another source. You will be responsible for any errors or omissions provided by the tool. It works best for topics you understand.
- AI is a tool, but one that you need to acknowledge using. Please *include a Process Log explaining if, how, and why you used AI and indicate/specify the prompts you used to obtain the results*. See Process Log Policy section.

Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. (Living our Unifying Values: The USC Student Handbook, page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. (Living our Unifying Values: The USC Student Handbook, page 13).

Course Evaluations

Course evaluation occurs at the end of the semester university wide. It is an important review of students' experience in the class. The intent of the end-of-semester evaluation is to provide an evaluation of the course, the instructor, and whether the learning objectives have been achieved. In addition, the instructor will provide an online mid-semester evaluation that will be used for early course correction.

Lecture and Exam Schedule

Week	Lecture	Date	Lecture Topic	Assignment Due Dates	Homework Topic
1	1	January 13, 2026	Introduction		
	2	January 15, 2026	Internet and Web Basics		
2	3	January 20, 2026	HTML		
	4	January 22, 2026	Style Sheets (CSS)		
3	5	January 27, 2026	JavaScript Basics		
	6	January 29, 2026	JSON		
4	7	February 3, 2026	Server-Side Scripts in Python		
	8	February 5, 2026	Document Object Model (DOM)		
5	9	February 10, 2026	Forms and CGI Mechanism		
	10	February 12, 2026	Vibe Coding		
6	11	February 17, 2026	JavaScript Advanced		*Cloud Setup (Python)*
	12	February 19, 2026	HTTP and Networking Theory		
7	13	**February 24, 2026**	**Written Exam #1**		
	14	February 26, 2026	JavaScript Frameworks	Assignment #1	
8	15	March 3, 2026	Responsive Website Design		
	16	March 5, 2026	Cookies and Privacy		
9	17	March 10, 2026	Web Services and REST		
	18	March 12, 2026	Ajax		
		March 15-22, 2026	**Spring Recess**		
10	19	March 24, 2026	Web Servers		
	20	March 26, 2026	Secure Communication / Web Server Performance		
11	21	March 31, 2026	Mobile App Development (Android)		*Cloud Setup (NodeJS)*
	22	April 2, 2026	Mobile App Development (iOS)		
12	23	April 7, 2026	High Performance Websites	Assignment #2	
	24	April 9, 2026	React and React Native		
13	25	April 14, 2026	Serverless Applications		
	26	April 16, 2026	HTML5 + New Technologies		
14	27	April 21, 2026	**Guest Lecture: Felix Lin**		
	28	April 23, 2026	**No Classes or Guest Lecture**		
15	29	April 28, 2026	Hacking the Web		
	30	**April 30, 2026**	**Written Exam #2**		
Final		**May 7, 2026**	**Final Project** Demonstration (On video) + Documentation	Refer to the final exam schedule in the USC *Schedule of Classes* at classes.usc.edu	

Statement on Academic Conduct and Support Systems

Academic Conduct
Office of Academic Integrity – (213) 764-4163
academicintegrity.usc.edu
Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in The USC Student Handbook, in the section titled "Integrity and Accountability". Other forms of academic dishonesty are equally unacceptable. The course uses the MOSS tool to check for plagiarism. All incidents of plagiarism will be reported to the *Office of Academic Integrity*.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

988 Suicide and Crisis Lifeline - 988 for both calls and text messages – 24/7 on call
The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL) – 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - (213) 740-2101
Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call
Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - (323) 442-2850 or otfp@med.usc.edu
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.