

GTECH 38400/78534

WebGIS

Spring 2025, Monday 5:30 – 8:20 PM

Location: HN 1090B-1

Instructor: Shipeng Sun

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Mailbox (Dept. Office): HN 1006

Office Hours: Monday 12 – 2 pm & By Appt.

Zoom ID: 735 204 6101

Course Description and Objectives

The future of GIS is web-based. This course introduces the principles and practical knowledge of WebGIS in a hands-on fashion. Students will learn two approaches to building interactive web maps. One is to use user-friendly software such as ArcGIS Map Viewer, Dashboard, and Experience Builder with little to no programming. The other is to combine popular open-source JavaScript libraries like Leaflet and web programming languages, primarily Markdown, HTML, CSS, and JavaScript, to create web-based visualizations. The course also introduces a few basic strategies of building and hosting web pages and WebGIS publicly. The course has six task-oriented lab assignments and one final course project.

Learning Outcomes

At the end of the semester, students should be able to

- describe the basics concepts and types of web applications and WebGIS
- build and configure basic web applications using templates-based approaches
- master at least one commonly used IDE for web development
- create WebGIS using programming-free tools like ArcGIS Dashboard
- design and develop simple WebGIS using JavaScript libraries like Leaflet

Pre-requisite

GTECH 70900 or GTECH 20100: Introduction to GIS, preferably also GTECH 73200: Advanced Geoinformatics or GTECH 36100 GIS Analysis.

Course Materials

Recommended Books and Resources:

- Haverbeke, M. ***Eloquent JavaScript: A Modern Introduction to Programming***. 3rd ed.: No Starch Press, 2019. (free version available online at <https://eloquentjavascript.net/>) For basic JS programming and this course, focus on chapter 1, 2, 3, 4, 13, 14, and 15.
- The Modern JavaScript Tutorial, <https://javascript.info/>
- Leaflet Tutorials at <https://leafletjs.com/examples.html>
- GeoServer User's Manual at <https://docs.geoserver.org/latest/en/user/>

Course Calendar & Content

Week	Session	Date	Topic	Lab Exercise
1	1	01/27/25	Introduction to general web applications and WebGIS; ArcGIS.com Web Map Viewer, Story Map, and Dashboard	ArcGIS.com Web Apps
2	2	02/03/25	ArcGIS.com Dashboard, Experience Builder, Arcade Script	Lab 0 (optional)
3	3	02/10/25	HTML Basics, Markdown, and Web-based Notebook	Lab 1 Due
4		02/17/25	College Closed	
4	4	02/18/25	Web Development with R Quarto, Observable Notebooks, and VS Code	Lab 2 Due
5	5	02/24/25	JavaScript Language I: Basics	
6	6	03/03/25	JavaScript Language II: Functions	Lab 3 Due
7	7	03/10/25	JavaScript Language III: Data Structures	Lab 4 Due
8	8	03/17/25	JavaScript and WebGIS with Leaflet I	Lab 5 Due
9	9	03/24/25	JavaScript and Browser I: DOM manipulation	Project Proposal Due
10		03/31/25	No Class Scheduled	
11	10	04/07/25	JavaScript and Browser II: Events	Project Checkpoint 1
12		04/14/25	Spring Recess	
13	11	04/21/25	JavaScript and WebGIS with Leaflet II	Project Checkpoint 2
14	12	04/28/25	WebGIS Design and Development	Lab 6 Due
15	13	05/05/25	WebGIS Calibration and Debugging	Project Checkpoint 3
16	14	05/12/25	Project Presentation	Project Discussion
17	15	05/19/25	Final Project	Project Report Due

Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice. Changes will be announced in class and on Blackboard, which students are expected to check regularly during the semester.

Software

- A modern web browser, Google Chrome, Microsoft Edge, and Mozilla Firefox preferred
- RStudio and R, with support for Quarto Website
- Microsoft Visual Studio Code® or any text editor with plugins/addons for JavaScript like Notepad++
- ArcGIS online access with a Hunter College or CUNY account
- A desktop GIS such as QGIS (Free and Open Source) or ArcGIS Pro (available in the Geography Lab and for CUNY students)

Grading Method & Scale

Evaluation of academic performance is based on the following components and breakdowns.

Components	GTECH 78534	GTECH 38400
Lab exercises	60%	60%
Participation	10%	15%
Project Proposal	10%	10%
Project Presentation	10%	15%
Project Report	10%	N/A

Numeric scores will be used throughout the semester. The course letter grade will be determined only at the end of the semester. There are no "extra-credit" assignments. If you need more time for a specific assignment, please request a possible extension at least 48 hours before the deadline.

Incomplete (IN) and Credit

The instructor cannot accommodate students who are late in their work or do not show up for the exam or presentation. And, unless you produce a medical certificate or letter from the Office of Accessibility, the instructor will not give the final grade of IN (incomplete). Graduate students are not eligible for Credit/No Credit as a final grade.

Policies

Communication

Professionalism and “netiquette” are expected in the communication through emails. If your emails are not replied to in a timely fashion, please consider rewriting your emails in a better way.

General Lab Policies

Lab policies are described in detail in
<http://www.geo.hunter.cuny.edu/techsupport/rules.html>.

Preferred Names and Pronouns

All people have the right to be addressed and referred to in accordance with their personal identity. In this class, we will have the chance to indicate the name that we prefer to be called and, if we choose, to identify pronouns with which we would like to be addressed. The instructors will do their best to address and refer to all students accordingly and support classmates in doing so as well.

Hunter College Policy on Academic Integrity

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

ADA Policy

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1214B, to secure necessary academic accommodations. For further information and assistance, please call: (212) 772-4857 or (212) 650-3230.

Hunter College Policy on Sexual Misconduct

In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444).

b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.

CUNY Policy on Sexual Misconduct Link:

<http://www.cuny.edu/about/administrationoffices/Ja/Policy-on-SexualMisconduct-12-1-14-with-links.pdf>