GTECH 38400 / 78534
WebGIS
Spring 2022, Monday 5:35 – 8:25 PM
Location: HN 1090B-1

Instructor: Shipeng Sun   **Mailbox (Dept. Office)**: HN 1006
Office: HN 1043   **Office Hours**: M 4-6pm, Tu 11am-12pm
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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 of building interactive web maps. One is to use user-friendly software such as ArcGIS Dashboard and Mapbender with little to no programming. The other is to combine popular open-source JavaScript libraries like Leaflet and web programming languages, primarily HTML, CSS, and JavaScript, to create web-based visualizations. In addition, we also learn the basics of geospatial web services in the backend as well as how to build and configure such services using the open-source GeoServer. The course has five 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 Geo-Web services;
- build and configure basic Geo-Web Services using software like GeoServer;
- describe the principles that the front-end WebGIS interacts with backend Geo-Web Services.
- 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

Required Textbook:
- Haverbeke, M. *Eloquent JavaScript: A Modern Introduction to Programming*. 3rd ed.: No Starch Press, 2018. (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.

Recommended Resources and Books:
- The Modern JavaScript Tutorial, https://javascript.info/
- GeoServer User's Manual at https://docs.geoserver.org/latest/en/user/
- Leaflet Tutorials at https://leafletjs.com/examples.html

Course Calendar & Content

Week	Session	Date	Topic	Lab Exercise
1	1	01/31/22	Introduction to Geo-Web Services and WebGIS	
2	2	02/07/22	Programming-Free WebGIS I	
3	3	02/14/22	Programming-Free WebGIS II	Lab 1
4		02/21/22	*College Closed*	
5	4	02/28/22	Basics of GeoServer	
6	5	03/07/22	JavaScript Language I: Basics	Lab 2
7	6	03/14/22	JavaScript Language II: Functions	
8	7	03/21/22	JavaScript Language III: Data Structures	Lab 3
9	8	03/28/22	JavaScript and Browser I: DOM manipulation	
10	9	04/04/22	JavaScript and Browser II: Events	Lab 4
11	10	04/11/22	JavaScript and WebGIS with Leaflet I	
12		04/18/22	*Spring Recess*	Project Proposal
13	11	04/25/22	JavaScript and WebGIS with Leaflet II	Lab 5
14	12	05/02/22	WebGIS Design and Development	
15	13	05/09/22	WebGIS Calibration and Debugging	
16	14	05/16/22	Project Development	Project Presentation
17	15	05/23/22	Project Presentations	Final Project

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, Mozilla Firefox and Google Chrome preferred
- Microsoft Visual Studio Code® or any text editor with plugins/addons for JavaScript like Notepad++
- ArcGIS online access with a Hunter College account (normally ????_HC)
- GeoServer (Free and Open Source), Mapbender (Open Source)
- 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	50%	50%
Participation	20%	20%
Project Proposal	10%	15%
Project Presentation	10%	15%
Project Report	10%	

Numeric scores will be used throughout the semester. The course letter grade will be determined only at the end of the semester, although guidance as to letter grade standing will be given along the way.

Each assignment is due before the next one is released. It is in your best interests to meet deadlines for assignments. Incomplete grades and time extensions are not an option for this course. There are no "extra-credit" assignments. Unless otherwise instructed, you will submit assignments in electronic forms through BlackBoard.

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

Attendance

Attendance is crucial, even when the lectures are recorded. Given that the class-learning environment is active learning, meaning that most your performance is practical assignments rather than tests, adherence to protocols and the course timetable is very important.

Electronics in the classroom

Electronic recording devices are allowed during lectures. All other personal electronics should be turned off before coming into the classroom. This includes cell and smart phones. Computers may be used for taking notes and doing the lab exercises, and should not be used for activities not related to classroom content.

Course Website

Web-enhancement in the context of this course means that everything pertaining to this course will be communicated through BlackBoard. You are expected to check the BlackBoard course site on a daily basis. All changes to the syllabus will be announced on the course home page. All lecture and lab materials are accessible through BlackBoard, and Blackboard is also the place where you upload your assignments. Your lab assignments will be graded based on what you have uploaded to BlackBoard and that is where you will find your grades and may access course statistics that help you to assess your standing at any given time.

Communication

All email messages about this course should include GTECH 38400 or 78534 in the subject line, and be signed with your full name as it appears in CUNYfirst. 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.

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:llwww.cuny.edu/about!administrationloffices/Ja/Policv-on-SexualMisconduct-12-1-14-with-links.pdf