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# ESC/GEO 455/555: Webmapping

Department of Geography & Earth Science

University of Wisconsin-La Crosse

Spring 2022, 3 Credits

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<b>Instructor:</b>	Gargi Chaudhuri, PhD	<b>Class Location:</b>	Cowley Hall 245
<b>Email:</b>	gchaudhuri@uwlax.edu	<b>Lecture Day/Time:</b>	Tues/Thurs-2:15-3:10PM
<b>Office Hours:</b>	Mon/Wed-2:30-4PM	<b>Lab Location:</b>	Cowley Hall 245
<b>Office Location:</b>	Zoom	<b>Lab Day/Time:</b>	Tues/Thurs-3:20-4:15PM

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## 1 COURSE DESCRIPTION

Online (web based) maps are increasingly becoming the preferred medium over traditional paper maps. Rather than being static, web maps are interactive and allow users to load information that they want, zoom in, zoom out, focus on an area of interest and even change the map presentation format. Creating and designing effective online maps is becoming both interesting and challenging. The aim of this course is to introduce students to the use and development of web based mapping tools to support information sharing, geodesign and decision making. The course emphasizes practical applications of Web GIS through Web scripting and user interface design using a variety of applications and application programming interfaces (API). The important elements of this course include:

- Scripting of Web based interfaces (HTML, CSS, JavaScript)
- User interface (UI) design (layout, navigation, browser/device limitations)
- Application Programming Interfaces (API) for web mapping such as Leaflet, Mapbox GL for JS and ArcGIS API for JS

### 1.1 Prerequisites

ESC/GEO 418 and ESC/GEO 305. It will be assumed that students will know the following: Desktop computers and Windows operating system; Web Browsing, Microsoft (MS) Excel, MS Word, MS Powerpoint, save a file to a given drive, create, name and rename files and folders, drag and drop files, send an email attachment, know/how of Canvas, know how/when to log-off/ shutdown, find a file or folder, know when it is appropriate to use 'Save as' instead of 'Save', download files from the web to a given folder, move files between drives, Zip/Unzip a file, use the start menu to locate and start a software, copy, paste and delete files, Select & print to a printer from Windows application, make a new folder in an existing folder, place an image in Microsoft Word/PowerPoint, and use "Help" from within a Windows application.

## 2 READINGS:

- **Textbook:** Muehlenhaus, I (2014), *Web Cartography*, CRC Press. .
- **Others:** Additional readings will be posted on Canvas course site.

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## 3 STUDENT LEARNING OUTCOMES

A successful ESC/GEO 455/555 student will learn:

- Prepare data for use in Web interface.
- Identify suitable Web Mapping methods to use for various project types.
- Design, develop and deploy interactive mapping tools.
- Identify interface usability.

### 3.1 Expectations from students

To be successful in this course, a student must

- Read assigned readings and go through the lecture materials regularly
- Listen to lectures carefully and take notes over written materials.
- Attend class regularly.
- Submit completed assignments, exams, homeworks, final projects and any other class activity within due dates.
- Ask questions and discuss topics within the lecture session. Clarify issues within class itself while the topic is being taught.
- *Graduate Students* are expected to produce better quality of the work for full grades.

## 4 ASSIGNMENTS

- **Lab Assignments:** You need to complete all lab assignments and submit in required format by its due date to be considered for full grades in each assignment. If you fail the lab assignments, you will fail the course. Late submission of any assignment is strongly discouraged. However, turning a lab late is encouraged over not doing it at all. Late submissions will be accepted until the last day of classes. **One week late submission will lose 25%** of their value and **more than one week late submission will lose 50%** of their value if more than one week late. In case of sickness or emergency, appropriate proof should be provided during late submission otherwise points would be deducted. You will have enough time to complete each assignment within assigned lab time with help from me and/or lab assistant. If you choose not to complete your work within lab time, it's your responsibility to finish on time by yourself.
- **Exercises:** There will be a number of exercises that you will be provided based on some lecture materials.
- **Review presentations:** Students will be assigned review materials to critically evaluate and present in class.
- **Exams:** There will be **two exams on the dates listed in the syllabus** and are designed to assess your comprehension of the presented materials. Two exams will be based on lecture materials and readings and will be named as Mid-term and Final exams. Make-up exams will be given **ONLY** during exceptional circumstances, such as illness or university-approved event, and proof will be required. In cases where you have a scheduling conflict with a university-approved event, it is **YOUR** responsibility to notify the instructor at least two weeks before the exam. In the case of emergencies, it is **YOUR** responsibility to notify the instructor that you will be unable to attend, preferably before the exam or within 24 hours after the exam.

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- **Final Project:** More information about the final project can be found in Final Project module in canvas. In the final project, students are required to complete a final web mapping project that will demonstrate their skill sets and tools learned in this class. For selecting the thematic focus/topic for the web mapping project student will discuss with the instructor. During the various lectures and lab exercises students will be shown multiple online/secondary data sources to procure spatial datasets that could be used for this project. The whole process of final projects takes last few weeks, and students are guided by few milestones which help them accomplish their task on time. **The final project submission items are not eligible for late submission.** If you fail to turn in any of the items by the due date then you will not receive any points for that item.
  - **For graduate students:** In addition to the items above, graduate students are required to write an academic paper based on their final project. Graduate students are strongly suggested to focus their final project topic within the context of their thesis work.

## 5 ATTENDANCE

You need to attend both lecture and lab session fully to get full points (2) for attendance. Please email the instructor if you plan/need to miss a class (lecture and/or lab) due to a specific reason. If you do not inform and miss a class (lecture and/or lab) 1 point will be deducted for each section (lecture -1 and lab -1). So missing one day of the class without informing the instructor will cost you -2 points.

### 5.1 COVID-19 Health Statement

Students with COVID-19 symptoms or reason to believe they were in contact with COVID-19 should call and consult with a health professional, such as the UWL Student Health Center (608-785-8558). Students who are ill or engaging in self-quarantine at the direction of a health professional should not attend class. Students in this situation will not be required to provide formal documentation and will not be penalized for absences. However, students should:

- notify instructors in advance of the absence and provide the instructor with an idea of how long the absence may last, if possible;
- keep up with classwork, if able;
- submit assignments electronically;
- work with instructors to either reschedule or electronically/remotely complete exams, labs, and other academic activities;
- consistently communicate their status to the instructor during the absence.

Instructors have an obligation to provide reasonable accommodation for completing course requirements to students adversely affected by COVID-19. This policy relies on honor, honesty, and mutual respect between instructors and students. Students are expected to report the reason for absence truthfully and instructors are expected to trust the word of their students. UWL codes of conduct and rules for academic integrity apply to COVID-19 situations. Students may be advised by their instructor or academic advisor to consider a medical withdrawal depending on the course as well as timing and severity of illness and students should work with the Office of Student Life if pursuing a medical withdrawal.

## 6 FORMAT & COURSE ACCESS

This is a face-to-face course. You need to be in class to attend lectures and work on lab assignments. You can ask questions and clarify doubts with the instructor in class during your session. You will need your UWL NetID to login to the course from the CANVAS homepage. Course materials will be available online,

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including lectures, lab assignments handouts, video demonstrations for assignments, quizzes, assignment dropboxes, and other miscellaneous instructions. The lab assignment data will be available via Geography server folders. Access to course materials in CANVAS will cease after the term ends. If you wish to archive materials for your personal records or portfolio you should do so as you progress through the course. As a general rule, you should always save local copies of course-related work. To avoid disasters, you should also save important files to external media or cloud storage.

## 6.1 Technical Support

For tips and information about Canvas visit the Canvas Guide for Student. You can also contact the ITS Support Center at (608) 785-8774 or helpdesk@uwlax.edu for questions about Canvas or any other technological difficulties. The hours for ITS are Monday through Thursday from 7:30 am to 6:30 pm, and Friday from 7:30 am to 4:30 pm, Central Time. For GIS software and computer issues in the lab please contact the GIS Lab Administrator Steve Fulton.

## 7 GRADING

### 7.1 SCHEME (in %)

A 93 – 100 | AB 88 – 92 | B 83 – 87 | BC 78 – 82 | C 70 - 77 | D 60 - 69 | F 59 & below

### 7.2 WEIGHT

Lab Assignments -	Assignments	40%
Exams -	Mid-term, final exam -	20%
Final Project -	Proposal, draft presentation, final presentation - Graduate Students* - includes draft paper and final paper	25%
Class Participation -	Exercises, Attendance, Reviews -	15%

## 8 STUDENT SUPPORT SERVICES

### 8.1 How to contact the instructor

If you have any issues talk to your instructor during class time or office hours. Check for email and office hours in syllabus. Do not completely rely on emails. If you have to send an email, email with clear subject, course and section number, use proper introduction, body of the email should explain the issue properly, and sign off with your name.

### 8.2 Expectations for graded work

Generally, I return graded assignments with individualized feedback, if needed, within 21 days from the due date of the assignment. I will notify you if I am unable to grade the work within the 21-day timeframe, and will identify a revised return date. If you submit work after the due date, it may not be returned within 21 days. The grades for any work that is graded electronically, such as scanned examinations or automated quiz, will be accessible to you within 21 days of the due date. If you submit electronically graded work after the due date, it may not be accessible within 21 days. Your graded coursework will be

returned in compliance with FERPA regulations, such as in class, during my office hours, or via the course management system through which only you will have access to your grades.

### 8.3 UWL Syllabus Policy Information & Statements

Please check here for statements regarding Academic integrity and misconduct, religious accomodation, sexual misconduct, student course and faculty related concern, students with disabilities, veterans and military personnel.

### 8.4 Academic Services and resources at UWL

Please check here to find out more about Academic Services and resources at UWL

## 9 SCHEDULE

This is a tentative schedule. Details about topic, exercises and due dates will be posted on Canvas. Any changes/updates in the schedule will be announced in class and/or Canvas.

Week	Topic	Assignment	Reading
1/25	Basics of Webmapping technology	Lab set-up	Ch.12
1/27	HTML	Lab#1, Ex#1	Read: HTML
2/1 & 2/3	Webmap Elements, CSS	Lab#2, Ex#2	Ch. 3, Read: CSS
2/8 & 2/10	JavaScript (JS)	Lab#3, Ex#3	Read: JS Basics
2/15 & 2/17	JS interactivity	Lab#4, Ex#4	Ch.4, Read: JS inter.
2/22 & 2/24	Leaflet, Map Composition	Lab#5	Read: Leaflet
3/1 & 3/3	GeoJSON	Lab#6, Ex#5	Read: GeoJSON
3/8	WebServers		Read: Webservers
3/10	<b>Mid-Term Exam</b> -upto GeoJSON	Webmap Rev#1 done	
3/15 & 3/17	Spring Break		
3/22 & 3/24	Thematic Viz. & jQuery	Lab#7, Ex#6	Ch.9
3/29 & 3/31	jQuery & Animation	Lab#8, Ex#7	Ch.10
4/5 & 4/7	Client-side Geoprocessing	Lab#9	Read: Geoproc
4/12 & 4/14	<b>Proposal - 4/12</b>	Lab#10	
4/19 & 4/21	Work on final project	Webmap Rev#2 done	
4/26 & 4/28	Work on final project	<b>Draft pres.-4/26</b>	
5/3 & 5/5	<b>Final project presentation</b>	<b>Write up - 5/5</b>	
<b>5/9</b>	<b>Final Exam</b> -from WebServers	<b>12:15 - 2:15 PM</b>	