

# Geovisualization

*GEOG 5201*

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## **Instructor:**

**Morteza Karimzadeh**, Lecturer, Department of Geography

**Office Location:** Derby Hall 1120

**Office Hours:** Monday 2:30-3:30 PM, Thursday 11 AM -12 PM

Or by appointment

**e-mail:** [karimzadeh.1@osu.edu](mailto:karimzadeh.1@osu.edu)

## **Teaching Assistant:**

**Jialin Li**, Graduate Student in Geography

**Office Location:** 1131 Derby Hall

**Office Hours:** Tuesday 8:20-9:20 AM Thursday, 8:20-9:20 AM

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## **Meeting Times:**

**Days:** Monday, Wednesday

**Time:** 3:55PM - 5:15PM

**Location:** Derby Hall 135

## **Course Description:**

This course provides a comprehensive overview of the theory and practice of geographic visualization, with applications in different domains such as science, policy, travel, and education. The goal of this course is to provide students with both the conceptual understanding and practical experience needed to design effective dynamic geographic representations. We will explore the potential and implications of recent advances in dynamic cartography, exploratory data analysis, and information visualization as they relate to the theory and practice of geographic visualization (geovisualization). A key focus of the course is on "dynamic" representations of geographically referenced information. Dynamic representations are those that change as a result of user actions or data updates. Topics include: animated and interactive maps, exploratory multivariate spatial data analysis, interactive web maps, geovisual analytics, mobile navigation aids, map-enabled decision-support, collaborative geovisualization, dynamic maps to enable learning, semiotic principles for design of dynamic maps and related geovisualization tools, and perceptual/cognitive issues in dynamic geo-representation. This course emphasizes the design of (dynamic or interactive) interfaces to maps rather than maps themselves. From a practical point of view, graduates of this course will be able to design and implement effective interactive map-based representations.

## Course Schedule

The current course schedule will be found in Carmen. You should expect some schedule updates during the term ... when they happen, they will be announced with Notifications within Carmen. You are responsible for setting Carmen to notify you via email or text upon receipt of Carmen messages.

## Required Materials:

The course has no required physical text. There are required readings that will all be available in electronic form, either through the library system, the Carmen course site, or directly online.

## Grading:

- Participation: 10%
- Labs (6): 25%
- Quizzes (4): 25%
- Final Exam: 10%
- Final Project: 30%

**Participation** in class and lab exercises and participation in classroom discussions are key to having a productive class. Of course, you actually have to attend class to earn a solid participation grade. Readings and weekly activities contribute to this portion of your grade. For example, you will be required to post short “reflections” on readings.

**Labs** There are 6 lab assignments. Labs are more or less cumulative and missing a lab can have major consequences for your ability to succeed in the class.

**Final exam** consists of answering theoretical questions related to dynamic cartography, information visualization and geovisualization.

**Final Project** is a major component of your overall grade. The final project is a group project that consists of two short presentations on interactive web apps that you will create, in your own domain of interest (health, crisis management, environment, demography etc.). A full description of the phases and deadlines will be posted on Carmen.

There will be four **quizzes** that will test your ability to apply concepts from class. One will focus on JavaScript (open-book), others will test theory and material covered in lectures. These three will be closed book.

I will use the scale below to calculate final grades. Note that grades are determined to 1 decimal place and rounded up to the next whole number.

Grade	Point Range (out of 100)
A	94 - 100
A-	90 - 93

B+	87 - 89
B	84 - 86
B-	80 - 83
C+	77 - 79
C	70 - 76
D	60 - 69
F	59 or lower

### Attendance:

Attendance in all classes and labs is mandatory. If you miss a class it is your responsibility to acquire the lecture/lab notes from a classmate. Poor attendance will reflect on your participation grade.

### Assignment Policy:

Be sure to include the following information in all of the assignments that you submit:

Your name

Course name and number

For all files (documents, applications, etc) that you submit, use the following convention for naming files. **Assignments that do not use this file naming convention will have 5% of the total possible for the assignment deducted from the score – no exceptions!**

{your\_last\_name}-{your\_initials}\_{name\_of\_assignment}.{appropriate\_suffix}

Please keep a copy of all your work. We cannot assume responsibility for lost items.

### Due Dates:

Course schedule and assignment descriptions in Carmen are your source for identifying due dates and assignment formats. Lab assignments are due in Carmen on the dates indicated in the lab instructions. All assignments, lab reports, and project proposals must be submitted as Microsoft Word (or Open Office files that are importable into Word) to enable comments and suggestions on your writing and must follow a specific format (given in the specific assignments.), with the exception of presentations, for which PowerPoint files or PDF slides suffice.

Any late assignments will be subject to a late penalty of -10%/day for each day late -- up to 7 days late (10% of the original total, thus a 30 point assignment that is 2 days late will have 6 points subtracted from the total score). **No assignments will be accepted that are more than 7 days late.**

### Lab Description

The labs have the objective of helping you acquire the skills to produce interactive, online maps (and related graphics), apply usability engineering methods to generate effective dynamic products, and to help you become proficient in finding answers to questions to tool development questions from a wide range of sources.

For the laboratory component of this course, we will focus on using a combination of HTML, CSS, JavaScript, and Leaflet –and for more advanced purposes, D3.js-. These technologies are all freely available on computers running a modern operating system (Windows, OS X, Linux) and no additional software is required; various commercial and open source software exists that can facilitate work with HTML, CSS, and Javascript. Some of the options you may want to consider will be discussed in lab.

There is a somewhat steep learning curve to web development that cannot be circumvented by purchasing software or books – hands-on experience (often accompanied by some frustration and failure) is key. It is easy to get discouraged at first, but please keep in mind that everyone will experience this initial difficulty. This frustration is especially true when it comes to debugging your projects (as you will find that a general rule of programming is that nothing works the first time you try it). The labs have been designed to introduce you to concepts and methods and to prompt you to be proactive in getting beyond the examples covered to the point of being able to adapt ideas/methods to new applications.

While your TA will help with debugging when and where possible, you will want to familiarize yourself with (1) your browser's debugging and help system and (2) online support networks (there are numerous available channels that will be discussed in labs). Pointers about each will be provided in Lab.

Web development is a valuable skill for securing future employment. After taking this course you will be able to list on a résumé having operable knowledge of web design principles, HTML/CSS/JavaScript, and some common software libraries used in web map development (with a focus on Leaflet).

## **Lab: Summary of Required and Recommended Materials**

***The best tutorials on all topics covered in this course are available for free online. One good set (there are many) are those by [www.w3schools.com](http://www.w3schools.com) (Links to an external site.)***Links to an external site.

Html: <http://www.w3schools.com/html/>

CSS: <http://www.w3schools.com/css/>

JavaScript: <http://www.w3schools.com/js/>

***If you would like to invest in a convenience provided by a reference text, you might find the following useful (most are cheaper used and some can be rented digitally at lower fees too):***

Coding with JavaScript for Dummies, \$20-26 new, ~\$15 - Kindle; ~16 - Google Play

JavaScript: The Good Parts, ~\$17, less to rent or used

Useful books for visualization principles and practice, with lots of ideas (also not required):

Interactive Data Visualization for the Web, Scott Murray, ~\$27 (~19 Kindle/Google Play)

The Truthful Art, Alberto Cairo, ~45 (~32 Kindle / Google Play)

***To work on your own computer rather than those in labs you would need (at minimum):***

A web browser (Mozilla Firefox and Google Chrome preferred, or Apple Safari; **NOT** Internet Explorer or Microsoft Edge)

A text editor (Visual Studio Code, a great editor with a full-featured 'trial', is recommended)

## Communication

My best advice to you is to see me during the office hours or set up an individual appointment if you have a scheduling conflict. Certain parts of this course are very much hands-on, and five minutes of in-person interactions are often more productive than an email thread spanning multiple days. Office hours are long and dreary, and nothing lightens up my mood better than to see a student walk in.

## Expectations and Etiquette:

I expect everyone to be respectful of class colleagues, the instructor and TA. Class disruptions and side conversations should be kept to a minimum. This includes turning off your cell phone ringer when you enter the class. In my view, talking or using an electronic device in class shows a lack of respect for the people sitting near you who are paying tuition to learn. **Laptops and mobile devices should not be used in the classroom (except on specific dates).**

I will work very hard to make sure that the class operates smoothly but computers sometimes misbehave, please be patient. I understand that this is a difficult class and that sometimes life is even less cooperative than computers. If you have a personal emergency, I will do my best to help you through the class, however ***under no circumstances can you excel in this class without completing the requirements and assignments.***

## Disclaimer

***Please note that this Course Syllabus and schedule are subject to change. Students are responsible for abiding by such changes.***

## University Policies:

**Disabilities:**

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu); 098 Baker Hall, 113 W. 12th Avenue.

**Religious observances:**

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance.

**Classroom Etiquette:**

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

**Academic Misconduct:**

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 33355487). For additional information, see the [Code of Student Conduct](#).

**Title IX Statement:**

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan at [titleix@osu.edu](mailto:titleix@osu.edu).