GEOG 6286 Syllabus

Course Information

- **Credit hours:** 3
- **Mode of delivery:** Asynchronous Online

Instructor

- **Name:** Sandy Wong
- **Email:** wong.484@osu.edu
- **Office location:** 1144 Derby Hall
- **Office hours:** Tues & Thurs 4-5pm, in office or CarmenZoom
- **Preferred means of communication:**
  - My preferred method of communication for questions is via message on **CarmenCanvas.** Direct emails via Outlook are likely to get lost in my inbox. Your messages must be professional, otherwise you are unlikely to receive a response. You can expect a response from me within 24 hours during normal business hours (i.e., Monday to Friday, 9am to 5pm), but not outside of these hours.
  - My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your notification preferences to be sure you receive these messages.

Course Prerequisites

GEOG 5210, or consent of the instructor if you have equivalent experience.

Course Description

This course provides an overview of **GIS applications in social science and business contexts**. GIS are powerful tools that we can use to visualize, analyze, and interpret spatial data. Students will leverage GIS to reveal patterns that allow us to better understand, inform, and address complex societal issues in such fields as urban planning, public health, and business analytics. In this course, through a blend of theoretical knowledge and practical exercises, students will gain proficiency in GIS software and tools, develop skills in spatial data collection and processing, and learn techniques for integrating and analyzing diverse datasets. The course begins with an introduction to key topics, including census geography, accessibility, mobility, optimization, and machine learning. Then, we transition to a term project in which students pick one social or business problem to examine and generate deliverables

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across the research design process, including reviewing the literature, collecting and processing data, analyzing data, and producing written and oral results. By the end of the course, students will be able to use GIS to investigate social and business challenges, and present their findings.

Learning Outcomes

By the end of this course, students should successfully be able to:

- Explain various spatial analysis methods and their application for analyzing societal problems.

- Collect, process, analyze, and visualize GIS data from different sources.

- Develop basic data processing tools using programming languages.

- Critically evaluate the use of geographic data and methods to investigate social science and business questions.

- Conduct and present GIS research for a business or social science project.

How This Course Works

Mode of delivery: This course is 100% online. There are no required sessions when you must be logged in to Carmen at a scheduled time.

Pace of online activities: This course is divided into weekly **modules** that are released every Thursday, with the exception of the first week when the first module will be released on the first day of class. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within that time frame, if applicable.

Credit hours and work expectations: This is a 3 credit-hour course. According to Ohio State bylaws on instruction, students should expect around 3 hours per week of time spent on direct instruction (instructor content and CarmenCanvas activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of C average.

Attendance and participation requirements: Research shows regular participation is one of the highest predictors of success. With that in mind, I have the following expectations for everyone's participation:

- **Participating in online activities**: **at least once per week**
  You are expected to log in to the course in CarmenCanvas every week. During most weeks you will probably log in many times. If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible.*

- **CarmenZoom meetings and office hours**: **optional**
  All live, scheduled events for the course, including my office hours, are optional. I will post recordings of synchronous sessions for those who cannot attend.

- **Participating in discussion forums**: **at least once per week**
  As part of your participation, each week you can expect to post at least once as part of our substantive class discussion on the week's topics.

Course Materials, Fees and Technologies

Required Texts

We will read journal articles and book chapters, all of which are available electronically through OSU's Library. Book chapters will come from the following book:

- Wang, F. & Liu, L. (2023). *Computational Methods and GIS Applications in Social Science*. Third Edition. Boca Raton, LA: CRC Press.

Required Equipment

- **Computer:** A PC or Mac computer with camera, microphone, keyboard, earbuds/headset. 256 GB hard drive storage (512 GB recommended) and 8 GB RAM (16 GB recommended).

- **Webcam:** built-in or external webcam, fully installed and tested

- **Microphone:** built-in laptop or tablet mic or external microphone

- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for technology and internet access at the Technology and Digital Innovation IT for Students website.

Required Software

Microsoft 365: All Ohio State students are now eligible for free Microsoft 365. Visit the installing Microsoft 365 help article for full instructions.

Python and Jupyter Notebook: Students will install Miniconda and Jupyter Notebook.

CarmenCanvas Access

You will need to use BuckeyePass multi-factor authentication to access your courses in CarmenCanvas. To ensure that you are able to connect to CarmenCanvas at all times, it is recommended that you do each of the following:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions.

- Install the Duo Mobile application on all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

Technology Skills Needed for This Course

- Basic computer and web-browsing skills
- Navigating CarmenCanvas
- CarmenZoom virtual meetings
- Recording a slide presentation with audio narration and recording, editing and uploading video

Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

- **Phone:** 614-688-4357 (HELP)
- **Email:** 8help@osu.edu

Grading and Faculty Response

How Your Grade is Calculated

Assignment Category	Points
Weekly lab exercises	25
Weekly quiz questions	15
Weekly discussion board participation	10
Term project	50

See Course Schedule below for due dates.

Descriptions of Major Course Assignments

Weekly lab exercises

Description: For the first five weeks, there will be a weekly lab exercise. The exercises provide an in-depth examination of concepts explored in lecture and hands-on experience with Python and Jupyter Notebook. Each exercise will be available on Monday at 8am and the deadline will be on Thursday at 11:59pm the following week, i.e., there will be over 10 days between when the assignment is published and when the assignment is due.

Academic integrity and collaboration: Your submissions should be your own original work. You are encouraged to seek external resources and/or to ask a trusted person to proofread your assignments before you turn them in but no one else should revise or rewrite your work.

Weekly quiz questions

Description: For the first five weeks, there will be open-book quiz questions that test you on course content and ask you to reflect on concepts and applications. Each question is worth 1 point and there are a total of 15 questions. Each quiz will be available on Monday at 8am and the deadline will be on Thursday at 11:59pm the following week, i.e., there will be over 10 days between when the quiz is published and when the quiz is due.

Academic integrity and collaboration: Your submissions must be your own work. No one else should be submitting answers on your behalf.

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Weekly discussion board participation

Description: For the first ten weeks of class, there is a discussion board for you to submit one post with at least two sentences that identify and/or describe one challenge you faced with your assignment, how you addressed it and/or how you found a solution. This could describe one error and how you fixed a line of code. This is intended as a space for classroom participation, collective troubleshooting, and informal collaboration of small problems. This is <u>not</u> a space for sharing answers to the assignment questions. If you are unsure about the appropriateness of your post, please message Dr. Wong on Carmen before you submit your post.

Academic integrity and collaboration: Your post should be your own work. You are encouraged to seek outside resources (e.g., online tutorials, forums) and cite them, but no one else should be submitting a post on your behalf.

Term Project

Description: For the latter part of the semester, you will pick one social or business problem to examine and generate deliverables across the research design process, including reviewing the literature, collecting and processing data, analyzing data, and producing written and oral results. You may use any type of GIS software (e.g., ArcGIS, QGIS, GeoDa), but you must use Python and Jupyter Notebook for at least one task in the process.

During Week 5, you will select one of the following problems to work on:

1. Where should (city) build 5 new green spaces to improve air quality and social equity? How many users would they attract and how much will it cost in construction and ongoing maintenance? Provide a list of locations, user estimates, and approximate costs.

2. In (city), where should Walmart open the next 5 stores that would attract a middle-class demographic? How much will it cost in construction and how much profit could be expected in the first year and first five years? Provide a list of locations, approximate costs, and estimated profits in 1 and 5 years.

Each student will work on a different location and you will provide a ranked list of cities to work on. Professor Wong will try her best to assign each student a city on their list.

You may propose a different project by the deadline of February 13. Your proposal needs to describe the problem, why it is an important social or business issue, and expected outcomes. You will also need to explain how you are adequately equipped to undertake this problem (e.g., you have the data already and you are expanding on an existing project). Your project cannot be a reproduction of work that you have already done for another class, but it can expand on a previous project. If you are unable to sufficiently justify why you are well-prepared

to execute your proposed project, then Professor Wong will assign you to one of the above problems.

Academic integrity and collaboration: Your submissions should be your own original work and cannot be reproductions of work that you have already done in a different class (i.e., self-plagiarism). In formal assignments, you should follow APA style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in but no one else should revise or rewrite your work.

Late Assignments

Please refer to CarmenCanvas for due dates. Due dates are set to help you stay on pace and to allow timely feedback that will help you complete subsequent assignments. The late penalty is 20% per day.

Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call 614-688-4357 (HELP) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me first via message on **CarmenCanvas**. I will reply to emails within **24 hours between 9am-5pm on days when class is in session at the university**.

- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check your notification preferences to ensure you receive these messages.

- **Discussion board:** I will check and reply to messages in the discussion boards once mid-week.

- **Grading and feedback:** For assignments submitted by the due date, I will try to provide feedback and grades within **seven days of the due date**. Assignments submitted after the due date may have reduced feedback, and grades may take longer to be posted.

Grading Scale

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70–72.9: C-

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67–69.9: D+
60–66.9: D
Below 60: E

Other Course Policies

Discussion and Communication Guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style**: While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics.

- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. I will provide specific guidance for discussions on controversial or personal topics.

- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.

- **Backing up your work**: Consider composing your academic posts in a word processor, where you can save your work, and then copying into the CarmenCanvas discussion.

Academic Integrity Policy

See [Descriptions of Major Course Assignments](#) for specific guidelines about collaboration and academic integrity in the context of this online class.

Ohio State's Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's [Code of Student Conduct](#), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- [Committee on Academic Misconduct](#)

- [Ten Suggestions for Preserving Academic Integrity](#)

- [Eight Cardinal Rules of Academic Integrity](#)

Artificial Intelligence and Academic Integrity

All students have important obligations under the Code of Student Conduct to complete all academic and scholarly activities with fairness and honesty. Our professional students also have the responsibility to uphold the professional and ethical standards found in their respective academic honor codes. Specifically, students are not to use "unauthorized assistance in the laboratory, on field work, in scholarship or on a course assignment" unless such assistance has been authorized specifically by the course instructor. In addition, students are not to submit their work without acknowledging any word-for-word use and/or paraphrasing" of writing, ideas or other work that is not your own. These requirements apply to all students — undergraduate, graduate, and professional.

To maintain a culture of integrity and respect, these generative AI tools should not be used in the completion of course assignments unless an instructor for a given course specifically authorizes their use. Some instructors may approve of using generative AI tools in the academic setting for specific goals. However, these tools should be used only with the explicit and clear permission of each individual instructor, and then only in the ways allowed by the instructor.

As an exception to the default prohibition on using AI tools for this course, you may use ChatGPT and similar tools for assistance with all assignments. For writing assignments, you are not allowed to use word-for-word use. Instead, you are to paraphrase and/or substantively edit AI-generated content (at least 85% as a guideline) and cite your use of the tool. You must double-check the work generated by AI, which can be wrong. If you submit work that is incorrect or irrelevant, even if it was generated by AI, you will not receive credit for it. If you are not sure if a tool you wish to use is permitted for our course or you wish to use a tool for specific purpose you think does not violate the principles articulated here, please contact Professor Wong to discuss it first.

Copyright for Instructional Materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form on the Office of Institutional Equity website,
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.

- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, on-demand mental health resources are available. You can reach an on-call counselor when CCS is closed at 614-292-5766. **24-hour emergency help** is available through the National Suicide Prevention Lifeline website or by calling 1-800-273-8255(TALK). The Ohio State Wellness app is also a great resource.

Religious Accommodations

With sufficient notice, instructors will provide students with reasonable alternative accommodations with regard to examinations and other academic requirements with respect to students' sincerely held religious beliefs and practices by allowing up to three absences each semester for the student to attend or participate in religious activities. Examples of religious accommodations can include, but are not limited to, rescheduling an exam, altering the time of a student's presentation, allowing make-up assignments to substitute for missed class work, or flexibility in due dates or research responsibilities. If concerns arise about a requested accommodation, instructors are to consult their tenure initiating unit head for assistance.

A student's request for time off shall be provided if the student's sincerely held religious belief or practice severely affects the student's ability to take an exam or meet an academic requirement and the student has notified their instructor, in writing during the first 14 days after the course begins, of the date of each absence. Although students are required to provide notice within the first 14 days after a course begins, instructors are strongly encouraged to work with the student to provide a reasonable accommodation if a request is made outside the notice period. A student may not be penalized for an absence approved under this policy.

If students have questions or disputes related to academic accommodations, they should contact their course instructor, and then their department or college office. For questions or to report discrimination or harassment based on religion, individuals should contact the **Office of Institutional Equity**.

Content Warning

Some content in this course may involve media that may elicit a traumatic response in some students due to descriptions of and/or scenes depicting acts of violence, acts of war, or sexual violence and its aftermath. If needed, please take care of yourself while watching/reading this material (leaving classroom to take a water/bathroom break, debriefing with a friend, contacting a confidential Sexual Violence Advocate 614-267-7020, or Counseling and Consultation Services at 614-292-5766 and contacting the instructor if needed). Expectations

are that we all will be respectful of our classmates while consuming this media and that we will create a safe space for each other. Failure to show respect to each other may result in dismissal from the class.

Weather or Short-Term Closure

Unless otherwise announced by the university, online or distance-learning classes will occur as scheduled.

Accessibility Accommodations for Students with Disabilities

Requesting Accommodations

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. 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.

If you are isolating while waiting for a COVID-19 test result, please let me know immediately. Those testing positive for COVID-19 should refer to the Safe and Healthy Buckeyes site for resources. Beyond five days of the required COVID-19 isolation period, I may rely on Student Life Disability Services to establish further reasonable accommodations.

Disability Services Contact Information
- **Phone**: 614-292-3307
- **Website**: slds.osu.edu
- **Email**: slds@osu.edu
- **In person**: Baker Hall 098, 113 W. 12th Avenue

Accessibility of Course Technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use

these technologies, please request accommodations as early as possible.

- [CarmenCanvas accessibility](#)

Course Schedule

This is subject to change. Refer to the CarmenCanvas course for the latest information.

Week	Topics, Readings, Assignments, Due Dates	Readings	Assignments, Due Dates
1	Course Introduction, Census Geographies & Demography	Anselin 2010, Jurjevich et al. 2018	Exercise 1, Lecture Quiz **Due Jan 16**
2	Accessibility	Wang & Liu 2023 Chapter 5, Saxon et al.	Exercise 2, Lecture Quiz **Due Jan 23**
3	Mobility	Chen et al. 2016, Wang & Liu 2023 Chapter 2	Exercise 3, Lecture Quiz **Due Jan 30**
4	Optimization	Li et al. 2022, Bao et al. 2020	Exercise 4, Lecture Quiz **Due Feb 6**
5	Machine Learning/GeoAI	Hu et al. 2024; Liu & Biljecki 2022	Exercise 5, Lecture Quiz, Term Project Deliverable 1: Pick a project and location **Due Feb 13**
6	Literature Reviews		Term Project Deliverable 2: Literature Review **Due Feb 20**
7	Research Designs	Literature Review	Term Project Deliverable 3: Research Design Plan **Due Feb 27**
8	Collecting Data	Literature Review	Term Project Deliverable 4: Collect Data **Due Mar 6**
9	Cleaning Data	Literature Review	Term Project Deliverable 5: Clean/Process Data **Due Mar 20**

10	*Spring Break*		
11	The Reality of Data Analysis	Literature Review	Term Project Deliverable 6: Analyze Data **Due Apr 3**
12	*No Class*		
13	Tips for Writing Up and Visualizing Results in a StoryMap		Term Project Deliverable 7: StoryMap **Due Apr 10**
14	Final Presentations		Term Project Deliverable 8: Recorded Video Presentation **Due Apr 17**
15	Final Projects		Peer Review of Term Project **Due Apr 21**