

SYLLABUS

GEOG 5210 Fundamentals GIS

Summer 2022

Course overview

Instructor

- **Mode of delivery: In Person**
- **Name:** Xiaoyu Liang, she/her
- **Email:** liang.918@osu.edu
- **Meeting hours:** Mon Fri 12:00pm – 1:35pm (lecture, DB1080), Wed 12:00pm – 1:35pm (lab, DB0135)
- **Office hours:** By appointment via email (if necessary, after posting questions on the discussion board).
- **Zoom link:**
- <https://osu.zoom.us/j/3084704139?pwd=Y3ZDU29PQzdyZmM4V2pJdnlQRlcwQT09>

Course description

This course introduces the principles of geographic information systems (GIS) and their applications in spatial analysis and information management. The course is designed to give students an understanding of cutting-edge geospatial technologies, their capabilities, uses, and limitations. Representative applications for each discipline area are demonstrated in the computer laboratory portion.

Course learning outcomes

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

- Communicate the applicability of GIS and spatial analysis in the present day.
- Create geospatial data from scratch or from existing geospatial data sources.
- Work with geospatial data, including access, management, and manipulation of spatial data.
- Utilize spatial functions and operations in the manipulation of spatial data, as appropriate to various contexts.
- Generate sharable outputs resulting from geospatial analyses, including in cartographic form using basic mapping principles.
- Connect concepts learned in class to real-world problems, workflows, and solutions.

Course Details

Course schedule

Date		Content	Lab	Exam
11-May	Wed	1 - An Introduction to GIS	Lab 1	
16-May	Mon	2 - Data Models	Lab 2	
20-May	Fri	3 - Geodesy, Datums, Map Projections and Coordinate Systems	Lab 3	
23-May	Mon	4 - Maps, Data Entry, Editing, and Output	Lab 4	
27-May	Fri	5 - Global Navigation Satellite System and Coordinate Surveying	Lab 5	Exam 1 (Lec 1 - 4)
30-May	Mon	Memorial Day - no class		
3-Jun	Fri	6 - Aerial and Satellite Images	Lab 6	
6-Jun	Mon	7 - Digital Data		
10-Jun	Fri	8 - Attribute Data and Tables		
13-Jun	Mon	9 - Basic Spatial Analysis	Lab 7	Exam 2 (Lec 6 - 8)
17-Jun	Fri	10 - Topics in Raster Analysis		
20-Jun	Mon	11 - Terrain Analysis	Lab 8	
24-Jun	Fri	12 - Spatial Estimation: Interpolation, Prediction, and Core Area Delineation	Lab 9	
27-Jun	Mon	13 - Spatial Models and Modeling	Lab 10	
1-Jul	Fri	14 - Data Standards and Data Quality		Exam 3 (Lec 9 - 13)
4-Jul	Mon	Final deadline		

Credit hours and work expectations

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

Course materials

There is no required textbook for this class. There is one recommended textbook *GIS Fundamentals: A First Text on Geographic Information Systems, 6th Edition* by Paul Bolstad (2019) for this course. The ISBN-13 for the paperback is 9781593995522. It is available for purchase in print or electronic format from the campus bookstore, Amazon, the publisher (XanEdu), etc.

Course technology¹

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help>, and support for urgent issues is available 24x7.

- Self-Service and Chat support: <http://ocio.osu.edu/selfservice>
- Phone: 614-688-HELP (4357)

¹ By courtesy of Dr. Emily S. Castellucci

- Email: 8help@osu.edu
- TDD: 614-688-8743

Baseline technical skills for online courses

- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the [Canvas Student Guide](#).
- [CarmenZoom virtual meetings](#)

Required equipment

- Computer: current PC (Windows 7+) or Mac (OS X) with high-speed internet connection
 - ArcGIS only works on a Windows system.
 - QGIS can work on both systems.
- Webcam: built-in or external webcam, fully installed
- Microphone: built-in or external microphone, fully installed

Required Software

Please keep in mind that **you are NOT required to purchase any software for this class**. The following list should help you access the software free-of-cost to you as a student in this class.

- Microsoft Office 365 ProPlus
 - All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Each student can install Office on five PCs or Macs, five tablets (Windows, iPad® and Android™) and five phones.
 - Students are able to access Word, Excel, PowerPoint, Outlook and other programs, depending on platform. Users will also receive 1 TB of OneDrive for Business storage.
 - Office 365 is installed within your BuckeyeMail account, not your OSU email account. Full instructions for downloading and installation can be found at <https://ocio.osu.edu/kb04733>.
- ArcGIS Pro
 - ArcGIS Pro is provided free-of-cost to OSU students, staff, and faculty for educational and research purposes under the ESRI Education Site License Program. You may review ESRI's privacy policies at [Esri Privacy](#).
 - Full instructions for downloading and installing can be found on Carmen Modules. **DO NOT attempt to download and install this software using any other method.** Otherwise, you might end up with the wrong software, the wrong version of the software, or a paywall when you should have free and unlimited access while a student.
 - For information about accessibility, visit Accessibility in ArcGIS Pro.

- Note for Mac users: ArcGIS Pro requires a Windows operating system. If you can install Windows on your Mac using Parallels, Boot Camp, VMWare Fusion, or a similar program, then you should be to install ArcGIS Pro.
- TECHNICAL SUPPORT:
 - Email the OSU IT Service Desk at shelp@osu.edu or call (614) 688-8743 for assistance with VPN and Duo authentication (i.e. “Second Password”).
 - Email esri-support@osu.edu for ArcGIS Pro technical support.
- QGIS
 - This is the leading open source desktop GIS software that is available free-of-cost. You can download the software from here: <https://qgis.org/en/site/forusers/download.html>
 - TECHNICAL SUPPORT: Successful download and installation of QGIS is ultimately the student’s responsibility. You may contact your instructor/TA with installation-related questions, but we cannot guarantee that we’ll be able to resolve all issues.

Carmen Access

You will need to use [BuckeyePass](#) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](#) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click Enter a Passcode and then click the Text me new codes button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the [Duo Mobile application](#) to 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.

Grading and response

Grades

Assignment	Percentage
Exams (3)	45 (15% each)
Lab (10)	40
Participation (lecture quizzes)	15
Total	100

Exams

There will be 3 short, noncumulative exams, which means each exam is independent. Each exam will:

- Contain only selection, matching, and fill-in-blank questions.
- Available for a week. You may take the exam any time during the week that it is assigned; you are not restricted to taking the exam only on the day that it is due.
- Timed. Exams will be 100 minutes. (If you are registered with SLDS for extended time accommodations, please confirm that extended time has been granted before you begin the exam.)
- Open-note. You can use the lecture slides, the handouts, your notes, the textbook, etc. However, using search engine is not allowed.
- Completed independently. You should not communicate with your classmate about the exam after one of you has started the exam. You should complete the exam by yourself. Collaboration with one or more other persons will be considered academic misconduct.
- Allowed only one attempt. Make sure you find a good time to finish the exam since you only have one chance to finish the exam.
- Graded immediately. Your grade should be visible as soon as you click Submit; if it is not, please notify your instructor. However, correct answers will not be available immediately; please check back after a week to review the correct answers.
- Password protected. You'll find the password (also known as "access code") in the quiz instructions, so make sure you read the instructions before you click Take the Quiz.
- If you accidentally disconnect during the exam momentarily, you should be able to resume the exam. If you cannot come back before the exam is available, the exam will automatically submit with the time is up.²
 - Tip 1: If you have a smartphone with a web browser, you should be able to use your cellular network (even if the WiFi connection is unavailable) to log in to Carmen on your cell phone's web browser and resume the exam, as long as the time isn't up. It's not ideal since you probably won't be able to access any notes efficiently, but at least you can still access the exam and enter answers.
 - Tip 2: To make your internet connection a little more stable, make sure nothing is streaming like video or online games. If you have roommates that are watching Netflix or gaming, you might want to ask them to take a break while you take your exam so that your WiFi access can be prioritized.

Do your best to ensure that you have a reliable internet connection and a reliable device (desktop, laptop, tablet, or phone) for accessing the exam before you get started. If you do completely lose access, cannot resume, and the exam submits before you can reestablish connection and submit answers, be sure to let me know. There may not be much that I can do, in the interest of fairness to all students, but I certainly want to hear about the situation to look into it, etc.

² Courtesy of Dr. Emily Castellucci

Labs

There will be 10 labs in 8 weeks, which will be published right after the related lecture. You will be provided with data, step-by-step document instructions, and a **full video walk-through for each lab**³. Usually, if you follow every step of the video, you should reproduce the results very easily. But keep in mind that the process of completing any given lab may not go as smoothly as planned. Unexpected challenges may arise, so it is best to plan for this.

Set a goal to submit each lab in advance of the deadline. That way, if unexpected challenges do arise, you have time to deal with them before the deadline passes.

Labs are submitted in a quiz-like format. You are given all the questions in advance, at the end of the lab instructions. When you are ready to submit your lab, you open the lab assignment, enter your answers and upload any required files, and click Submit. Some questions are graded automatically, and some questions require manual grading.

- For automatically graded questions, you'll be able to see the correct answers a week after the due date for that lab. (Note: Sometimes Carmen Canvas formatting makes it look like fill-in-the-blank responses have been incorrectly graded. For concerns about fill-in-the-blank questions, please wait until after correct answers are released to contact me with your concerns. Continue to contact me immediately with all other concerns.)
- For manually graded questions, our goal is to return feedback and grades in a week, but that timeline is influenced by a variety of factors, so your patience is appreciated. Once grades are published, if you did not receive full credit, you should review the feedback so that you know how to improve. If you have any trouble finding the feedback, please let us know.

Lab grading policy and late policy

I understand the difficulties to keep up with the fast pace of this class due to the nature of summer semester. Therefore, I will implement several policies to help you cope with the challenges:

- I will select **the 9 labs with the highest scores** out of the total 10 as your final score for the lab part. For example, if the full point is 20 pts and your scores for the 10 labs are 20, 20, 20, 20, 20, 11, 20, 20, 20, 20, the lab with 11 pts will be dropped and your final score will be full points.
- Late policy: if you still cannot submit the quiz before the deadline of two weeks, there will be an automatically applied penalty for late submission. **The late penalty is 5% (of the total possible score) per day and it will not reduce below 80%.**
- If you are a senior and you will graduate this semester, the final deadline may be earlier. I will make notification later.

³ Courtesy of Dr. Luyu Liu

Participation

After each lecture, a quiz on the topic will be published in Carmen which is made up of several questions discussed in class. Each quiz is due before the next lecture.

- Extra points (5%): Attendance is strongly encouraged and will be recorded at all class meetings (lectures and labs).

Grading scale

92.5–100: A

89.5–92.49: A-

86.5–89.49: B+

82.5–86.49: B

79.5–82.49: B-

76.5–79.49: C+

72.5–76.49: C

69.5–72.49: C-

66.5–69.49: D+

59.5–66.49: D

Below 59.5: E

Instructor feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course.

Grades and feedback

I will try to finish the grading process within 7 days once the assignment's deadline has passed. More or less time may be needed, depending on the complexity of the assignment.

E-mail and discussion boards

I usually reply to e-mails and discussion board posts within 24 hours on school days. Please make sure you attach [GEOG5210] in the title of the email so that I can be more responsive. A kind reminder will be appreciated if you do not receive the response in 3 days in case that I accidentally miss your email.

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.
- **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 Carmen discussion.

Other course policies

Health and safety requirements

All students, faculty and staff are required to comply with and stay up to date on all university safety and health guidance (<https://safeandhealthy.osu.edu>), which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses.

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 a student is suspected that he/she has committed academic misconduct in this course, I am obligated by university rules to report the suspicions to the Committee on Academic Misconduct. (Note that "warnings" are not given due to an offense being one's first offense, due to ignorance of what constitutes academic misconduct, or due to any other circumstances.) 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.

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

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- Ten Suggestions for Preserving Academic Integrity ([Ten Suggestions](#))
- Eight Cardinal Rules of Academic Integrity (www.northwestern.edu/uacc/8cards.htm)

Academic integrity information specific to this course

Collaboration for the purposes of troubleshooting is highly encouraged in this course, but everyone is expected to complete all assignment tasks themselves and submit their own unique work. With this in mind, here are some examples of acceptable and unacceptable behavior:

- Acceptable:
 - Asking a classmate how to resolve an unexpected error message, how to find a hidden setting in the software, or similar troubleshooting tasks.
 - Participating in a study group study the course material.
 - Asking a trusted person to proofread (without revising or rewriting) your assignments before you turn them in.
- Unacceptable:
 - Using another student's work (in part or in full) as your own.
 - Sharing files and/or using shared files that contain intermediate or final results.
 - Submitting the same work (even if modified) from a past semester or from another course.
 - Comparing and/or sharing answers before submitting a graded assignment.
 - Forgetting to cite sources, including the course materials, websites visited, etc.

There are many other acceptable/unacceptable actions than those exemplified here, so if you have any questions or concerns about acceptable/unacceptable actions or what constitutes academic misconduct in this course, **ask your instructor for clarification/permission.**

Copyright disclaimer

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.

Statement on title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or

sexual exploitation, you may find information about your rights and options at titleix.osu.edu or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit equity.osu.edu or email equity@osu.edu.

Statement on diversity

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.

As an international student, a part of the majority group in my home country, and a part of the minority group in the US, I strongly feel the issue of diversity cannot be addressed by this monotonous template. I am definitely willing to hear from any of you about the suggestions to make our classroom more inclusive, your thoughts on the class, and more general comments on my teaching.

Accessibility accommodations for students with disabilities

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's [request process](#), managed by Student Life Disability Services. 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; 614-292- 3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Accessibility of course technology

This online course requires use of Carmen (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 with your instructor.



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. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273- TALK or at suicidepreventionlifeline.org

Disclaimer

This course syllabus provides a general plan for the course; deviations may be necessary. Such deviations may be made for individuals or for the entire class, as deemed appropriate by the instructor. Any changes that affect the entire class will be announced by the instructor with as much advance notice as possible.

Acknowledgement

Special thanks to Dr. Emily S. Castellucci and Dr. Luyu Liu for their generous help and permission to reuse many materials.