THE OHIO STATE UNIVERSITY

Department of Geography

SYLLABUS - GEOG 5210 Fundamentals of GIS

Autumn 2024
3 Credit Hours, Hybrid
Lecture – online
Lab Sections: Derby Hall 0135, M or W 4:10 – 5:05 p.m.

Course overview

Instructor and Teaching Assistant (TA)

Primary instructor: Dr. Tammy E. Parece
Email: parece.1@osu.edu
Office: Derby Hall 1189
Open Office hours: Monday 1 – 2 p; Tuesday, 11 – Noon; Wednesday 10 – 11 a
Zoom by appointment only.
You can generally expect a reply to e-mails within **48 hours on school days.**

TAs: Jon Anderegg; anderegg.2@buckeye.osu.edu
See Carmen Canvas for office hours and locations.

If you are ill or have symptoms, please do not visit us in our offices, please email us and we can set up a zoom link for your participation during our office hours. To request an appointment outside of the above times, please send both instructor and TA an email with your availability up to a week ahead.

Course description

This course introduces basic principles of geographic and land information systems and their use in spatial analysis and information management.

Course learning outcomes

By the end of this course, students should successfully be able to:
- Understand the fundamentals of cartography and Geographic Information Systems
- Demonstrate practical skills using ArcGIS Pro

How This Course Works

Mode of delivery

Your lectures are pre-recorded and online.

Your labs (recitations) are in Derby Hall 0135.
- *In-person attendance at labs is strongly recommended*

Pace of online activities: This course is divided into weekly modules. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within that time frame.

Credit hours and work expectations: This is a 3-credit-hour course. According to The Ohio State University policy, an average student should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) and up to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

Important: Do not expect to complete entire lab assignments during the scheduled lab time. Lab sessions are 55 minutes, and it takes longer than 55 minutes to complete the GIS assignments. Therefore, you will need to either 1) finish the lab using software installed on your own computer or 2) return to the computer lab when it is not in use for other classes.

Course materials

- Required Lab Book: Shellito, Bradley A. Discovering GIS and ArcGIS Pro, 3rd edition. Macmillan Publishers. You *cannot* use a prior edition.
- Optional Book: GIS *Fundamentals: A First Text on Geographic Information Systems, 6th Edition* by Paul Bolstad (2022). ISBN-13 is 9781593995522.
- Additional required reading materials/videos/websites are provided within Canvas.

Course technology

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

Basic technical skills required:
- Basic computer and web-browsing skills
- Navigating Carmen: see the Canvas Student Guide.
- CarmenZoom virtual meetings

IMPORTANT: The next two sections indicate equipment and software that you must be able to access to complete lab assignments for this course. You have access to these items in Derby 0135, but if you install the software on your own computer, you will be able to finish GIS assignments at home.

Hardware

- Computer: current PC (Windows 7+).
- USB Drive
- Other: a mobile device (smartphone or tablet) to use for BuckeyePass authentication

Software

Please remember you are NOT required to purchase any software for this class. You will use a word processing program, a spreadsheet program, Adobe reader and ArcGIS Pro.

Carmen Access

You will need to use BuckeyePass multi-factor authentication to access your courses in Carmen. To ensure that you can always connect to Carmen, 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.

If none of these options 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 scale

92.5–100: A	76.5–79.99: C+
90.0–92.49: A-	72.5–76.49: C
86.5–89.99: B+	70.0 –72.49: C-
82.5–86.49: B	66.5 –69.99: D+
80.0–82.49: B-	60.0 –66.49: D
	Below 59.99: F

Note – I do not round up. An 89.99 does not round up to 90%. If you want an A/A-, then you must achieve 90% or better.

Grade Breakdown

Assignment or category	Percentage
Labs	60
Final Project	15
Weekly Quizzes	15
Introduction Discussion	01
Graded Weekly Discussions	09
Total	100

Assignment information

Failure to follow the instructions on any assignment will result in at least a 10% grade reduction for that specific answer (it might result in an incorrect answer). Any assignment includes quizzes, labs, and the final project. As examples, if the directions state you need to round to 1 decimal place and you give no decimal points or provide 2 or more; instructions state a screenshot of your login area, and you provide a screenshot of the entire ArcGIS Pro window.

Quizzes (15% of total grade)

There will be weekly quizzes. Each quiz will be …
- *Due on by 11 a.m. on Monday* of the week after the topic in the schedule for that week
- Late quizzes are not accepted.
- Timed 20 minutes. (If you are registered with SLDS for extended time accommodations, please confirm that time has been granted before you begin the quiz.)
- You cannot get assistance on quizzes; these are required to be your own work.
- Collaboration with any other person is considered academic misconduct.
- 13 quizzes (Weeks 1 – 13), your 2 lowest quiz grades will be dropped.

Final Project/Final Exam (15% of total grade)

You have a final project in lieu of a final exam. No late submissions. Watch due dates – there are 3 for the final project (the proposal, the data library including a literature review for graduate students, and the final project itself). If you are an undergraduate student, you can opt to take a final exam in lieu of completing a final project. To notify us that you want to take this option, upload a statement to this effect into the final project proposal folder.

Online Discussions (10% of total grade)

You will participate in online discussions. Week 1, we start with introductions of ourselves. As part of this requirement, you need to respond to other student's post finding something in common or something interesting or intriguing to you about the other person (3 reply posts are required). These are required for all students. (**1% of total grade, ½ for your introduction and ½ for the reply posts**).

The rest of the semester, we will have an online discussion each week (12 total). In many weeks, I will be posting a question that you will need to research and answer. Graded Discussions are marked as graded. There will be 12 weeks of discussion opportunities, you must participate in 9. Posts are due no later than Wednesday of the week following the topic. You will not receive credit for any discussion post that duplicates another student's post. The best way to avoid this is to post early, otherwise you will need to read **all** posts before adding your own. (**9% of total grade**).

Labs (60% of total grade)

You will complete 14 Modules in the Shellito lab book. These Modules are not completed in numerical order, so see the schedule. You also need to be careful as the deliverables vary from Module to Module. In some instances, you answer questions posed in the Shellito Module. In some, you will be submitted a map document, screenshots, or a written report. In many weeks, more than one module is due.

You will have 3 lab assignments that are not from the Shellito book.

Remember that completing any given GIS assignment may not go as smoothly as planned, unexpected challenges will arise. Set a goal to submit each lab in advance of the due date, then if unexpected challenges do arise, you have time to deal with them. Some questions are graded automatically & some require manual grading. There is a question and answer (Q&A) area in Canvas for questions about Lab assignments. Posting comments about the labs in the graded discussions will not count towards your discussion grade.

Late Assignments

Late submissions for any assignments are not accepted in this course.

You have 1 chance to extend your deadline for 1 calendar day during the semester, applied to your chosen lab assignment. No permission is required, use this opportunity wisely, it can only be used once.

Accommodations for religious holidays will be considered. A request must be submitted prior to any assignment due date that conflicts with such holidays. Please provide information on the holiday and its date and the number of days requested in the extension.

Additionally, in case of personal and family emergencies, please notify us as soon as possible so that we can work out a submission timeline. Such extensions may or may not be granted, it is decided on a case-by-case basis. Extensions are not granted after the fact, e.g., you can't ask for an extension on an assignment that was due two weeks before or wait until the end of the semester to submit assignments you missed. To request an extension for one of these emergency conditions, you must put the request in writing to Dr. Parece (cc to the TAs) and the email must contain the following information:

<div align="center">

Course Name and Code (GEOG 5210 Fundamentals of GIS)
Reason for the extension request:
The specific assignment:
Specific extension requested:
Attach documentation of the reason for the extension

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Any emails requesting extensions without this information will be returned with a request to provide this information.

Course Academic Integrity Policy

Turnitin (https://www.turnitin.com/) is a plagiarism and AI verification platform. This check is set to automatically review any written documents submitted in an assignment folder. Please note that any assignments with a score of 25% or more may result in reporting a code of conduct violation to OSU's Committee on Academic Misconduct (please see the Academic Integrity Policy below).   Please note that when you use quotes or repeat the assignment instructions within a written report, it increases the Turnitin and AI score. Avoid these when at all possible.

To maintain a culture of integrity and respect, generative AI tools should not be used in the completion of course assignments, quizzes, discussion posts, and exams unless specifically authorized by Dr. Parece.

Instructor feedback and response time
Grades and feedback

You can expect grades and feedback to be returned within 1 week once the assignment's deadline has passed, depending on the complexity of the assignment. If you have questions about your grade, you must address them to Dr. Parece within 48 hours of posting of that grade. For quizzes that are automatically graded, answers will be posted after the due date and available for 1 week only.

Discussion board questions

You can expect a reply to Q&A posts within **48 hours on school days**. Although you might receive replies outside of those hours, please do not expect this. The determination of urgency is at the discretion of the instructor/TA. If you wait until the day an assignment is due to post a question, we cannot guarantee an immediate reply.

Participation, discussions, and notifications

Student participation requirements

The following is a summary of student's expected participation:

- All work in this class must be your own.   There are no joint assignment submissions for this class for any assignment!
- *In-person attendance at labs is strongly recommended.*
- Participating in discussion forums: Every week, there is a discussion board, and there is also a discussion forum for lab questions. *Please post your questions to the appropriate discussion board. Posting questions to discussion boards is helpful as other students may have the same or similar questions.*
- Logging in: Be sure you are logging in to the course in Carmen each week. During most weeks you will 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.*
- Confidential Questions: Don't post questions online that may indicate answers to graded assignments and questions regarding your own grades. The former is an academic integrity concern, and the latter is a privacy concern.

Discussion and communication guidelines

The following are expectations for how we should communicate as a class. 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. (Note: Excessive grammar, spelling, or punctuation errors in discussions or any other assignment submissions will be penalized at the discretion of the instructor/TA.) A more conversational tone is fine for non-academic topics.
- **Tone and civility**: Maintain a supportive learning community where everyone feels safe and people can disagree amicably. Remember that sarcasm doesn't always come across online. Be respectful to other students, the TAs and the instructor. Treat others as you would want yourself treated.
- **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.

Managing notifications

How can I manage notifications about course activity?

You can tailor your notifications by going to Account > Notifications. You can choose Email

and/or Push notifications. You can choose what types of activity you want to follow.

If you are not receiving notifications of discussion board activity, you may need to subscribe to the discussion board itself. Open the discussion board and click Subscribe (near top right). Alternatively, make a reply, and you will be automatically subscribed.

If you want email notifications but you're not getting any at all, regardless of activating email notifications, then you may need to go Account > Settings and verify your email address.

OTHER COURSE AND UNIVERSITY POLICIES

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 3335-5-48.7 (B)). For additional information, see the Code of Student Conduct | Ohio State (osu.edu).

Turnitin has been enabled for the lab and final paper submissions (https://www.turnitin.com/). Turnitin is a plagiarism and AI verification platform. This check is set to automatically review your paper when you submit it on Canvas. Please note that any assignments with significant scores may result in reporting a code of conduct violation to OSU's Committee on Academic Misconduct (please see the Academic Integrity Policy below).   Please note that when you use quotes or repeat the assignment instructions within your written report, it increases the Turnitin and AI score. Avoid these when at all possible.

To maintain a culture of integrity and respect, generative AI tools should not be used in this complete of course assignments including lab reports, quizzes, exams, and final paper unless specifically authorized by Dr. Parece.

There has been a significant increase in the popularity and availability of a variety of generative artificial intelligence (AI) tools, including ChatGPT, Sudowrite and others. These tools will help shape the future of work, research and technology but when used in the wrong way, they can stand in conflict with academic integrity at Ohio State.

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.

Disability Services

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 ill and need to miss class, including if you are staying home and away from others while experiencing symptoms of a viral infection or fever, please let me know immediately. In cases where illness interacts with an underlying medical condition, please consult with Student Life Disability Services to request reasonable accommodations. You can connect with them at slds@osu.edu; 614-292-3307; or Disability Services (osu.edu).

Religious Accommodations

Ohio State has had a longstanding practice of making reasonable academic accommodations for students' religious beliefs and practices in accordance with applicable law. In 2023, Ohio State updated its practice to align with new state legislation. Under this new provision, students must be in early communication with their instructors regarding any known accommodation requests for religious beliefs and practices, providing notice of specific dates for which they request alternative accommodations within 14 days after the first instructional day of the course. Instructors in turn shall not question the sincerity of a student's religious or spiritual belief system in reviewing such requests and shall keep requests for accommodations confidential.

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. (Policy: Religious Holidays, Holy Days and Observances | Office of Academic Affairs, The Ohio State University (osu.edu).
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Mental Health Statement

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 24/7 **by dialing 988 to reach the Suicide and Crisis Lifeline**.

Statement on Title IX

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 at titleix@osu.edu.

Diversity and Inclusion

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.*

Inclement Weather

Should in-person classes be canceled, we will meet virtually via CarmenZoom during our regularly scheduled time. I will share any updates via [CarmenCanvas, email or other mode of communication].

Course Schedule

Disclaimer: This course syllabus provides a general plan for the course; deviations may be necessary. Any changes that affect the entire class will be announced by the instructor with as much advance notice as possible.

Week & Dates	Topics and Assignments - **This schedule is subject to change**	Weekly Learning Objectives
Week 1 August 20 - 24	Course Introduction, Introduction to Geospatial Technologies, GIS data Syllabus Quiz due no later than 11 a.m. on 8/27 Introduction Discussion Posts due 8/28 Shellito Modules 1 & 3 due 8/28 End of Week Survey due 8/24 (optional)	Summarize Course Requirements Identify and explain the 3 geospatial technologies Explain how ArcGIS Pro is set up Differentiate between Layout View and Map View in ArcGIS Pro Generate and export a complete and final map document in ArcGIS Pro
Week 2 Aug 25 - 31	Geodesy, Datums and Map Projections Week 2 Quiz due no later than 11 a.m. on 9/3 Week 2 Discussion Post due 9/4 Projections Lab due 9/4	Describe a datum Explain the differences in projection systems Identify characteristics of a specific projection system
Week 3 Sept 1 – 7 Labor Day 9/2 – no class	Map Design, Attribute Data and Tables Week 3 Quiz due no later than 11 a.m. on 9/9 Shellito Modules 2 & 8 due 9/10 Week 3 Discussion Post due 9/11	Explain the elements of a map Identify which specific elements are required in different maps Explain attribute data and tables Demonstrate how to construct a query
Week 4 Sept 8 – 14	Coordinate Systems Week 4 Quiz due no later than 11 a.m. on 9/16 Coordinate Systems Lab due 9/17 Week 4 Discussion post due 9/18	Identify different coordinate systems Explain the importance of difference coordinate systems Describe when a specific coordinate system is used
Week 5 Sept 15 – 21	Thematic Maps Week 5 Quiz due no later than 11 a.m. on 9/23 Week 5 Discussion Post due 9/25 Modules 6 & 7 due 9/27 End of Week Survey due 9/21 (optional)	Identify the 5 different types of maps Describe the differences between qualitative and quantitative maps Demonstrate how to generate a specific thematic map Explain normalization of data
Week 6 Sept 22 – 28	Vector Models Week 6 Quiz due no later than 11 a.m. on 9/30 Week 6 Discussion Post due 10/2	Describe the components of vector models Explain what type of data should be modeled as a vector file Identify vector data Demonstrate how to edit a vector file with GIS
Week 7 Sept 29 – Oct 5	Spatial Data Analysis with Vector, Geocoding Week 7 Quiz due no later than 11 a.m. on 10/7 Shellito Modules 9 & 10 due 10/8 Week 7 Discussion Post due 10/9	Differentiate between types of spatial analyses Identify the appropriate GIS tool to use in a specific spatial analysis Demonstrate the geocoding process Review the accuracy of a geocoded dataset
Week 8 Oct 6 - 12	Raster Data Models Week 8 Quiz due no later than 11 a.m. on 10/14 Shellito Module 12 due 10/15 Week 8 Discussion Post due 10/16	Describe the components of raster models Explain what type of data should be modeled as a raster file Identify raster data Differentiate between types of resolution Demonstrate basic geoprocessing of raster data

Week 9 Oct 13 - 19	Raster, continued, with Terrain Analyses Week 9 Quiz due no later than 11 a.m. on 10/21 Shellito Modules 14 & 15 due 10/22 Week 9 Discussion Post due 10/23 End of Week Survey due 10/19 (optional)	Explain interpolation Identify different interpolation methods Demonstration of creation of different terrain models
Week 10 Oct 20 - 26	GIS Data Sources, Data Standards, Ethics, Georeferencing Week 10 Quiz due no later than 11 a.m. on 10/28 Georeferencing Lab due 10/29 Week 10 Ethics Discussion Post due 10/30	Demonstrate use of the National Map Viewer for locating geospatial data Explain metadata Identify how to locate and download geospatial data Demonstrate how to adequately cite geospatial data Identify Ethical Situations Demonstrate the georeferencing process
Week 11 Oct 27 – Nov 2	Aerial and Satellite Images Week 11 Quiz due no later than 11 a.m. on 11/4 Shellito Modules 13 due 11/5 Week 11 Discussion Post due 11/6 Project Proposal due 11/5	Describe remote sensing Explain the electromagnetic spectrum Demonstrate remote sensing techniques using ArcGIS Pro
Week 12 Nov 2 - 9	Global Navigation Satellite Systems Digitizing New Shapefiles & Displaying x, y data Week 12 Quiz due no later than 11 a.m. on 11/12 Shellito Module 5 due 11/12 Week 12 Discussion Post due 11/13	Demonstrate how to digitize data within ArcGIS Pro Explain GNSS Produce a vector file from collected data
Weeks 13 Nov 10 – 17 Nov 11, Veteran's Day – no class	Spatial Data Bases, Spatial Modeling Week 13 Quiz due no later than 11 a.m. on 11/18 Week 13 Discussion Post due 11/20 Shellito Module 20 due 11/22	Describe spatial databases Utilize Boolean Operators in performance of a suitability analysis
Weeks 14, 15 & 16 Nov 18 – Dec 11	Final Project Work time Last Day of class December 4 Final Projects are due December 5 Final Exams December 6 - 10 (undergrad students who elected the exam in lieu of a final project)	