Department of Geography

# **SYLLABUS - GEOG 5210 Fundamentals of GIS**

Summer 2025, May 6 – June 27, 2025 3 Credit Hours, online

# **Course overview**

## Instructor

Primary instructor: Dr. Tammy E. Parece Email: <u>parece.1@osu.edu</u> Office: Derby Hall 1189 I will be in my office Monday, Wednesday and Fridays from 9 a.m. – 1 p.m. (except on May 26, June 19). Other dates may be cancelled – please check announcements in Canvas.

You do not need an appointment to meet me with during those times. If you are not in Columbus and wish to zoom with me, please send me an email for a personalized zoom link. I am available (with advanced notice) to zoom with you outside of those dates and times.

Course Communications: You can avoid email by posting questions in the appropriate Q&A in the course site. You can generally expect a reply to e-mails and questions posed in the Q&A with 48 hours **on regular business days**.

#### **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

This is an online class. Lectures are pre-recorded and online.

**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 which normally meets over 16 weeks. This summer schedule is abbreviated to 8 weeks to cover the same materials, so you are basically doing two regular semester weeks course materials in one summer week.

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 for a regular semester course. Double that time for this 8 week course.

## **Course materials**

- Required Lab Book: Shellito, Bradley A. Discovering GIS and ArcGIS Pro, 3<sup>rd</sup> 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**

*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 if you are in Columbus, but you can install the software on your own computer.* 

#### Hardware

- Computer: current PC (Windows 7+). ArcGIS Pro does not work on Apple operating systems unless you have a dual operating system option.
- Other: a mobile device (smartphone or tablet) to use for BuckeyePass authentication

#### Software

Please keep in mind that 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.

## **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 <i>–</i> 66.49: D
	Below 59.99: F

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

# Grade Breakdown

Assignment or category	Percentage
Labs	60
Final Project/Final Exam	15
Weekly Quizzes (6)	15
Graded Weekly Discussions (7)	10
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 OR 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 ...

- 15 points each.
- Late quizzes are not accepted.
- Timed 30 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.
- 6 quizzes (Weeks 1 6), your lowest quiz grade will be dropped.

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

Graduate Students have a final project in lieu of a final exam. No late submissions. Your final project includes a literature review and a recorded presentation. Final Project Proposals are due June 17 and the final project is due 6/27.

Undergraduate students have an online final exam due by the last day of class, June 27.

#### **Online Discussions (10% of total grade)**

You will participate in online discussions. Read the instructions carefully as we cover multiple topics each week. I will be posting a question that you will need to research and answer. Graded Discussions are marked as graded. There will be 7 weeks of discussion opportunities, you must participate in 6. Watch the due dates because of holidays, they may vary. 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.

#### Labs (60% of total grade)

You will complete 13 Modules in the Shellito lab book, a georeferencing lab, and 1 online tutorial. The Modules are not completed in numerical order, so see the schedule. In some instances, you answer questions posed in the Shellito Module and enter those answers into an untimed quiz. In others, you submit a map document, screenshots, or a written report. Multiple modules are due each week, remember this is a compressed class.

Keep in mind that the process of completing any given GIS assignment may not go as smoothly as planned, unexpected challenges will arise. Set a goal to complete each assignment 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. It is recommended that you read the Lab Q&A before posting your question as another student may have already posted the question.

#### Late Assignments

Due to the rapid nature of this course, late submissions for any assignments are not accepted. Accommodation 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 me as soon as possible so that we can work out a submission timeline. 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 and the email must contain the following information:

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

Any emails requesting extensions without this information will be returned with a request to provide this information. Such extensions may or may not be granted, it is decided on a case-by-case basis.

### Instructor feedback and response time

**Grades and feedback** 

You can generally 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 boards**

You can generally expect a reply to Q&A posts within **48 hours on business days**. Although you might receive replies outside of those hours, please do not expect this. The determination of urgency is ultimately at the discretion of the instructor. If you wait until the day an assignment is due to post a question, a reply by the due date is not guaranteed.

## **Course Academic Integrity Policy**

Turnitin (<u>https://www.turnitin.com/</u>) 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.

# 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!
- Participating in discussion forums: Every week, there is a graded discussion board, and there is also a discussion forum for lab questions or general course 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 regularly. 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*.
- 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 in an online forum. 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) 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 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.

# **Other course/University 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 (<u>https://safeandhealthy.osu.edu</u>), which includes optional wearing of a face mask in any indoor space and maintaining a safe physical distance at all times. If you make an appointment to meet with me in my office, I do request that you wear a facemask.

# Academic integrity policy

All assignments, exams, and quizzes are required to be your own work. Use of AI is not permitted in this course.

Turnitin (<u>https://www.turnitin.com/</u>) 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 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 your written report, it increases the Turnitin and AI score. Avoid these when at all possible.

## **Ohio State's academic integrity policy**

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 3335-5-487). For additional information, see the Code of Student

#### **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 students 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

#### **Disability Services**

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.

## **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*.

#### Sexual Misconduct/Relationship Violence

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 <u>http://titleix.osu.edu</u> or by contacting the Ohio State Title IX Coordinator at <u>titleix@osu.edu</u>

#### **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 people 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.

### 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.

Week & Dates	Weekly Learning Objectives
Topics and Assignments	This schedule is subject to change
Week 1: May 6 – 10 Topics: Course Introduction, Introduction to Geospatial Technologies, GIS data, Geodesy, Datums and Map Projections <u>All assignments due May 12</u> W1 Quiz: GIS, Geodesy, Datums & Map Projections W1 Discussion Post: Datums and Map Projections Lab Assignments: Shellito Modules 1, 2, & 3	<ul> <li>Summarize Course Requirements</li> <li>Identify and explain the 3 geospatial technologies</li> <li>Explain how the setup of ArcGIS Pro</li> <li>Differentiate between Layout View and Map View in ArcGIS Pro</li> <li>Generate and export a complete and final map document in ArcGIS Pro</li> <li>Describe a datum and explain the differences in projection systems</li> <li>Identify characteristics of a specific projection system</li> </ul>
Week 2: May 11 – 17 Topics: Coordinate Systems, Map Design, Attribute Data and Tables, Thematic Maps <u>All Assignments due May 19</u> W2 Quiz Coordinate Systems & Map Design W 2 Discussion Post: Thematic Maps Lab Assignments: Projections & Coordinate Systems Lab	<ul> <li>Explain the elements of a map</li> <li>Identify which specific elements are required in different maps</li> <li>Explain attribute data and tables</li> <li>Demonstrate how to construct a query</li> <li>Identify different coordinate systems</li> <li>Explain the importance of difference coordinate systems</li> <li>Describe when a specific coordinate system is used</li> <li>Identify the 5 different types of maps</li> <li>Describe the differences between qualitative and quantitative maps</li> <li>Demonstrate how to generate a specific thematic map</li> <li>Explain normalization of data</li> </ul>
<ul> <li>Week 3: May 18 – 24</li> <li>Topics: Vector Models &amp; Vector Spatial Data Analysis</li> <li><u>All Assignments due May 27</u></li> <li>W3 Quiz Vector Data Models &amp; Boolean Expressions</li> <li>W3 Discussion Post: Geoprocessing Tools</li> <li>Lab Assignments: Shellito Modules 5, 6 &amp; 8</li> </ul>	<ul> <li>Identify and describe the components of vector models</li> <li>Explain what type of data should be modeled as a vector file</li> <li>Demonstrate how to edit a vector file with GIS</li> <li>Differentiate between types of spatial analyses</li> <li>Identify the appropriate GIS tool to use in a specific spatial analysis</li> </ul>
<ul> <li>Week 4: May 25 – 31 Monday, May 26 Memorial Day Holiday</li> <li>Topics: Geocoding, Georeferencing, GIS Data Sources, Data Standards, Ethics</li> <li><u>All Assignments due June 2</u> W4 Quiz Data Standards &amp; Ethics W4 Discussion Post: Ethics</li> </ul>	<ul> <li>Demonstrate the geocoding process</li> <li>Review the accuracy of a geocoded dataset</li> <li>Demonstrate use of the National Map Viewer for locating geospatial data</li> <li>Identify how to locate &amp; download geospatial data</li> <li>Demonstrate how to adequately cite geospatial data</li> <li>Identify Ethical Situations</li> <li>Demonstrate the georeferencing process</li> </ul>

### GEOG 5210 Fundamentals of GIS Schedule – Summer 2025

Lab Assignments: Shellito Modules 9 & 10 and Georeferencing	
<ul> <li>Week 5: June 1 - 7</li> <li>Topics: Raster Data Models, Interpolation, and Terrain Analyses</li> <li><u>All Assignments due June 9</u></li> <li>W5 Quiz Raster Data Models &amp; Terrain Analysis</li> <li>W5 Discussion Post: Terrain Analysis: Minnesota Department of Natural Resources</li> <li>Lab Assignments: Shellito Modules 12, 14 &amp; 15</li> </ul>	<ul> <li>Describe the components of raster models</li> <li>Identify and explain what type of data should be modeled as raster data</li> <li>Differentiate between types of resolution</li> <li>Demonstrate basic geoprocessing of raster data</li> <li>Explain interpolation and metadata</li> <li>Identify different interpolation methods</li> <li>Create different terrain models</li> </ul>
<ul> <li>Week 6: June 8 – 14</li> <li>Topics: Aerial and Satellite Images, Global Navigation Satellite Systems, Digitizing New Shapefiles &amp; Displaying x, y data</li> <li>W6 Quiz Remote Sensing &amp; GNSS due 6/16</li> <li>W6 Discussion Post: Land Observation Satellites due 6/16</li> <li>Lab Assignments: Shellito Module 13 due 6/16</li> <li>Module 20 due 6/22</li> </ul>	<ul> <li>Describe remote sensing</li> <li>Explain the electromagnetic spectrum</li> <li>Demonstrate remote sensing techniques using ArcGIS Pro</li> <li>Demonstrate how to digitize data within ArcGIS Pro</li> <li>Explain GNSS</li> <li>Utilize Boolean Operators in performance of a suitability analysis</li> </ul>
Week 7: June 15 – 21 Topics: Spatial Data Bases, Spatial Modeling No quiz All Students: W7 Discussion Post due June 23 Graduate Students Only – Final Project Proposal due 6/17 Week 8: Jun Final Projects due June 27	Describe spatial databases <b>e 22 - 27</b> 7 (Graduate Students)
Final Exam: Opens on June 23 and is due June 27 (Undergrad students)	