🌎 GEO 441B/541B - Geographic Information Systems - Spring 2025

Prepared by Dr. Shenyue Jia, January 2025 | Last Updated on Apr 1, 2025

🎓 COURSE INFORMATION

- **Instructors**

  Dr. Shenyue Jia | Assistant Professor | Department of Geography | jiashenyue.info
  jias10@MiamiOH.edu | Office: Shideler Hall (SHD) 212

  Pius Appau (TA) | Master of Arts Student | Department of Geography
  appaupk@MiamiOH.edu

- **Time and Place to Meet**

  Wednesday & Friday, 08:20 AM - 9:50 AM | Shideler Hall (SHD) 132 (room schedule)

- **Office Hours**

  Dr. Shenyue Jia
  Tuesday, 5 - 6:30 PM (SHD 132, computer lab)
  Friday, 5 - 6 PM (SHD 132, computer lab)
  Private office meeting possible if requested

  Pius Appau (TA)
  Wednesday, 5 - 7 pm (SHD 132, computer lab)

- **How to Contact Your Instructors outside Class and Office Hours**
  - **Email/Message your instructors via Canvas are both acceptable**
    - **For emails, please indicate the class you are enrolled**
  - Emails/Canvas messages will be answered in 24 hrs during business days
    - Friday night messages will be answered on Monday

✨ABOUT OUR COURSE

- Required for Miami University's **GIS Certificate** Program
- Required for **Urban and Regional Planning** major

Introduces the structure, concepts, capabilities, and functionality of Geographic Information Systems (GIS) and geospatial science inquiry. The course focuses on the management and processing of spatial data, emphasizing data models and structures, geographic data input, data manipulation and storage, spatial analysis and modeling techniques.

Students will learn to frame and solve a sequence of problems with GIS across a wide range of topics, including environmental planning, biogeography, conservation biology, sustainable development, natural resource conservation, environmental justice, political geography, and urban geography and planning.

📚 REQUIRED MATERIALS

Textbook: GIS Fundamentals (7th Edition) | Paul Bolstad & Steven Manson | 2022

Print (ISBN 9780971764750), ebook (Redshelf ISBN 9780971764767; VitalSource ISBN 9780971764774) | Publisher: Eider Press

Textbook Website and Resources

- **Link** | Contains videos for lab directions, lab data and directions, and more

Why do we need a textbook for this class and how to save?

- Course readings for quizzes, instructions for some in-class activities and lab assignments
- **Obtaining or renting an ebook is the best way to save (Redshelf, VitalSource)**

Course Canvas site

- Your go-to resource to read activity/lab instructions, make submissions, take tests
- Top Hat class from Canvas site: For attendance taking and in-class activities

Course GitHub repository

- **Link to repository** | Contains templates of lab assignments to help you get started

Software

- ArcGIS Pro, GitHub Desktop, Google CoLab, and Microsoft Office

💯 EVALUATION

🙋 Participation (10%)

- Class session attendance **(5%)**
- **Every student has two chances of no-show; no questions asked, and no need to contact your instructor beforehand**
- If you anticipate an extenuated situation, talk with your instructor individually
- Meeting Dr. Shenyue Jia in person during office hours in Spring 2025 **(5%)**

🎮 Weekly reading quizzes (10%)

- Multiple choice and fill-in-the-blanks only
- Quiz will be available for the whole week from Wednesday until next Tuesday
- You can take as many times as you want. **The highest score will be recorded**

👩‍🏫 In-class questions (10%)

- Short questions administered through **Top Hat**
- May be used as a way of classroom interaction (e.g. poll) instead of a quiz
- **Those who are using their two chances of absence will be excused for questions during that class; no make-up is needed**

📖 Lab assignments (25%)

- Detailed directions will be provided; TA help available

🚀 **Mid-term exam (20%)**

- Practice exam will be available two weeks ahead of the exam
- Exam will be administered through Canvas
- You need to take this exam in SHD 132 on the exam day

💻 **Group project (25%)**

- Project proposal (10%)
- Project final report (15%)
- You will choose a topic from a pool provided based on your interests
- You will be put into groups by the topic you choose (**4-5** students per group) and work on the project together
- **Timeline**
  - **Feb 14:** Topic pool available
  - **Feb 28**: Topic decided and group formation finished
  - **Apr 9:** Project proposal presentation
  - **Apr 30, May 2 and May 7:** Dedicated class time for working on the project
  - **May 9:** Group project final presentation on
- Group Score (⅔) + Individual Score (⅓) in your points for group project
  - An evaluation form will be provided to let you rate your own contribution and your peers' contribution from three perspectives to determine your individual score

Grade booster: Attend 40% of qualifying GEO colloquiums and events to have one assignment dropped by your choice at the end of the semester

📝 GRADING SCALE

100 (A+)	99-93 (A)	92-90 (A-)	89 (B+)
88-83 (B)	82-80 (B-)	79 (C+) 78-73 C	72-70 (C-)
69 (D+)	68-53 (D)	52-50 (D-)	< 50 (F)

🗓️ WEEKLY SCHEDULE

Course Material Difficulty Color Code : Easy, : Medium, : Difficult, : Intense
Key Dates for Evaluation: ; IM: Instructor-provided materials

WK	Date	Content	Textbook Reading
1	Jan 29	Welcome & Introduction to Geospatial Technologies	Ch 1
	Jan 31	Introduction To Geospatial Technologies; Cartography (I)	Ch 1, Ch 2 Vector Data Models, Ch 4 Cartography
2	Feb 5 Feb 7	No class meeting on both days; Generating notebook in Google Colab using Markdown; Data models	IM, Ch 2

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WK	Date	Content	Textbook Reading
3	Feb 12	Coordinate systems and How Does Positioning Work	Ch 3, 5, IM
	Feb 14	Map Projections; **Group project topic pool available**	Ch 3, IM
4	Feb 19	Scale and Coordinate Transformation	Ch 4
	Feb 21	Where to Find Spatial Data	Ch 7, IM
5	Feb 26	Use Vector Data: Attribute Table and Geometry	Ch 2, Ch 8
	Feb 28	Use Vector Data: Query or Filter by Attributes **Group project topic determined**	Ch 8 & 9; IM
6	Mar 5	Use Vector Data: Query or Filter by Attributes	Ch 8 & 9; IM
	Mar 7	Use Vector Data: Query or Filter by Location	Ch 8 & 9; IM
7	Mar 12	Practice Vector Data Query and Filter	Ch 8 & 9; IM
	Mar 14	Practice Vector Data Query and Filter; Q&A for Midterm	Ch 8 & 9; IM
8	**Mar 19**	**Midterm**	
	Mar 21	Raster Data Model and Acquisition	Ch2, 6, IM
9	Mar 26 Mar 28	Spring Break; No Class Meeting	
10	Apr 2	Spatial Analysis for Vector Data: Buffer Analysis	Ch 9, IM
	Apr 4	Spatial Analysis for Vector Data: Overlay	Ch 9, IM
11	Apr 9	Spatial Analysis for Raster Data	Ch 10
	Apr 11	Terrain Analysis	Ch 11
12	Apr 16	Bring Spatial Analysis Together: Work with Census Data	Ch 12
	Apr 18	**Project Proposal Presentation**	**Ch 8, 9, IM**
13	Apr 23	Spatial Estimation	Ch 8, 9, 10, 11, 12
	Apr 25	Bring Spatial Analysis Together: Spatial Analysis Recap	Ch 15

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WK	Date	Content	Textbook Reading
14	Apr 30	Web GIS Tools	
	May 2	Project Work Day (I)	
15	May 7	Project Work Day (II)	
	May 9	**Project Presentation**	

📓 COURSE POLICIES

1. You must arrive on time and stay until class is dismissed.
2. Regular and prepared attendance is required by University Policies. **Excessive absence from the course may result in an F or being dropped**.
3. **Every student has two chances of being absent without any penalty or need for prior notification. No questions will be asked.** It is recommended to save these chances for a sick day or mental health needs. If you have an extenuating situation that will cause more than two absences, please speak with your instructor.
4. Miami University recognizes that students may have **religious observances** that conflict with class sessions. Students need to provide written notification of class session(s) that will be missed due to these observances. **Notification must be at least one week prior to the holiday date when class will be missed**. This will not be counted towards the two allowed absences.
5. Students are responsible for all material presented in assigned readings and lectures. Lectures will not be repeated during office hours.
6. You are responsible for checking your **email** and the Canvas Course site for any updates each day before class. Make sure that you have **Canvas Announcements notifications turned on**.
7. **Late assignments will be penalized for 10% every late day**. The only exception to this is if the instructor is contacted with a valid reason at least 24 hours in advance of the due date/time. An extension may be granted in extreme cases. Penalties may still apply even with approved excuses.
8. Students are expected to contribute to an environment that is respectful to fellow students and conducive to learning. **You may NOT use phones during class unless I explicitly give you permission.** If you violate this policy, you will be asked to leave the room.
9. This syllabus may be amended at any time by the instructor as necessary. Students will be notified of any changes in class.
10. Please do not bring in food or drinks to the lab. Water bottles permitted but BE CAREFUL!

11. As a class, we will often be working as one large collaborative unit, as well as in other group projects. You are expected to be respectful to your peers, the instructor, and yourself. This includes giving everyone a break – including yourself – on learning new and often difficult concepts, science, and software. **All of you are capable of learning and doing well. I expect nothing less.**
12. We will follow the university's policies on mask-wearing and other guidelines regarding COVID-19 and extreme weather arrangements. Your instructor or TA may wear a mask while in the classroom or during office hours.
13. The content of the syllabus may be modified during the semester to address potential needs. You will be notified should that happen.

⚖️ ACADEMIC INTEGRITY | UNIVERSITY POLICIES

1. Students violating university policies regarding personal conduct and academic honesty are subject to disciplinary measures. Cheating, copying, and plagiarism will result in a failing grade and any other actions listed in the student handbook.
2. Cheating: using or attempting to use or possessing any **unauthorized aid**, information, resources, or means in the completion of an academic assignment or providing such assistance to another student (see more in Undergraduate Students Academic Integrity Policy document).
3. Possessing, referring to, or using in any way unauthorized textbooks, notes, study aids, websites, crib/cheat sheets, **AI tools**, or other information during an academic assignment, in paper, electronic, or other format
4. **Submitting material, in whole or part, generated through an artificial intelligence output-generating program, software, or application without permission from the instructor.**

🖥️ USE OF AI IN GEO 441B/541B SPRING 2025

AI is Allowed (throughout specified assignments)

- Use of Generative AI is allowed in this course under the parameters outlined below. Generative AI is a tool that is important for you to know how to use. Like any tool, it has appropriate and inappropriate uses. AI also has limitations.
    - AI output is not always accurate, may be contradictory, may be biased, may be overly vague, and may not be current. AI has been known to "make stuff up," particularly quotes and sources. You are responsible for what you submit. If you submit fake sources/citations/quotes, that will be academic dishonesty. If you submit inaccurate or unsubstantiated information, that will result in a poor grade.
    - I recommend that you find a credible source for any AI-provided information that you choose to use (the **Librarians** can help you with this!). I do not recommend asking AI to provide you with a list of sources for fact citation.
    - The information generated by AI is limited by the prompt you provide.
- You may use AI to assist in technical directions, idea/topic generation, organizing/outlining, creating early drafts, or polishing a final draft. Any use of AI in your work must be cited and acknowledged appropriately.
    - **You may include an Acknowledgement section at the end of your assignment describing how you have used GenAI to complete the work, such as initiating ideas or providing technical guidelines.**

    - For some assignments, you may be required to annotate your assignment explaining your choices regarding the AI output.
- You are responsible for your final submission
    - Your submission should demonstrate your understanding of the information.
    - Your submission must meet the assignment guidelines.
    - You may not use AI to generate your final submission wholly.
    - **Suspected use of AI to generate an entire submission or without appropriate citation/screenshot history will be reported as academic dishonesty.**
- Any assignments on which AI CANNOT be used are noted in the assignment guidelines.

♿ ACCOMMODATIONS & ACCESSIBILITY

If you are a student with a disability and feel that you may need a reasonable accommodation to fulfill the essential requirements of the course that are listed in this syllabus, you are strongly encouraged to contact Student Disability Services (SDS) at (513) 529-1541 (V/TTY) to discuss accommodations and available support resources.

📞 DUTY TO REPORT

As an instructor, I have a **duty to report.** This means I am **required to promptly report to the Deputy Title IX Coordinator** (titleix@miamioh.edu or 513-529-1870) any information a student shares with me regarding harassment, discrimination, sexual misconduct and interpersonal violence, or retaliation. A report does not initiate an investigation. It engages a discussion of your resources, supportive measures, and options available. If students want to speak with someone confidentially, they can speak with Student Counseling Services, Student Health Services, and an advocate with Women Helping Women.

Speaking with a confidential resource person does not preclude students from making a formal report to the University if and when they are ready.
https://miamioh.edu/diversity-inclusion/programs-resources/report-incident/index.html

For more information, please visit https://miamioh.edu/campus-safety/sexual-assault/ and https://www.miamioh.edu/diversity-inclusion/oeeo/index.html.

🧭 STUDY RESOURCES

Lab Videos and Notes from Textbook
You can find videos and notes to help you finish many lab assignments from the website of the textbook we are using (GIS Fundamentals).

Miami University GIS Resources
Most up-to-date information regarding our GIS certificate program, software installation and support, **remote access to SHD 132 and 134 computers**, etc.

Miami University Library Subject & Course Guides for Geography
- Refer to the library's subject and course guide for Geography and GIS;
- Contact Geography and GIS librarians for project help and other needs
    - Kristen Adams
    - Roger Justus

Howe Center for Writing Excellence
Get help regarding reference citations, class essay writing, and turning your class project into a storytelling/science-communication piece

Tutoring Service
The Rinella Learning Center does not offer tutoring services for our class. However, if you need extra help beyond the assistance we offer during class meetings, office hours, TA office hours, and other forms of communication, you can **contact Robbyn Abbitt (abbittrj@miamioh.edu), our GIS Coordinator,** to request tutoring service from our graduate students or undergraduate students who have taken this course before.