



ILS 595: GIS Research Methods Syllabus

Course Information

- **Course number and title:** Fall 2024 ILS 59500-010 LEC
- **CRN:** 29259
- **Meeting day(s) and time(s):** Fall 2024, T/Th 1:30 p.m.-2:45 p.m.
- **Class location:** WALC 3045
- **Instructional Modality:** Face-to-Face/ Lecture
- **Course credit hours:** 3.000
- **Prerequisites:** No prior knowledge of GIS is required to take this course.

Instructor(s) Contact Information

- **Instructor:** Dr. Innocensia Owuor
- **Office Location:** 2032M
- **Office Phone Number:** 765 494 2715
- **Purdue Email Address:** iowuor@purdue.edu
- **Student consultation hours, times, and location:** Emails (Brightspace or Purdue email) will be read 8 a.m. to 5 p.m. Mon-Fri and responded to within 24 hours. Use **ILS 595** subject line on the emails.

Office hours are available on **Wednesdays 12 p.m.-1 p.m.** by appointment, either face-to-face or remotely. A help section on the Brightspace discussion board will be set up for students to ask and answer each other's FAQs.

Course Description

This course will introduce you to the skills of spatial thinking, basic functions of Geography Information Systems (GIS), and spatial research methods that are relevant to Engineering, Agriculture, Environmental Studies, Humanities and Social Sciences. The course will start with introduction to basic GIS concepts and technology, then move onto GIS applications during the research process, including spatial research design, data collection, management, visualization, and spatial analytical techniques. Practical work will be introduced and completed using ESRI ArcGIS Pro software.

Learning Resources, Technology & Texts

Required texts and/or e-book

- Reading assignment will be based on this book:

Steinberg, Sheila, and Steven Steinberg (2015). GIS Research Methods: Incorporating Spatial Perspectives. Esri Press, Redland, California.

The Purdue Libraries has an eBook copy of the textbook. You can access it using your PUID here:

https://purdue.primo.exlibrisgroup.com/permalink/01PURDUE_PUWL/uc5e95/alma99169198773701081

Additional readings

- The following book might be a useful reference for the software used in this course, but it is not required for this course:

Law, Michael, and Amy Collins (2016). *Getting to Know ArcGIS Pro*. ESRI Press, Redlands, California.

Software/web resources:

- ESRI ArcGIS Pro

Use of artificial intelligence (AI) or Large Language Models (LLM) in this course

- Generative AI (GAI) tools like ChatGPT and DALL-E 2 can enhance learning by serving as editors, translators, and idea generators. However, they can also produce inaccurate content, so it's important to verify their output. In this course, you may use GAI for refining work, but the core ideas must be your own, and any GAI use must be cited to avoid academic dishonesty. GAI should support, not replace, critical thinking and creativity.

Academic Success and/or Tutoring support

- The Helen Bass Williams [Academic Success Center](#), provides a variety of proactive, practical and approachable academic support services for you to strengthen your approaches and strategies for learning, including study skills consultations, peer coaching, workshops, and online handouts. [Visit the ASC website](#) for more information and to access resources.

Purdue Libraries and School of Information Studies support

- I encourage you to visit [Ask a Librarian](#) to connect with helpful resources and services provided by the Purdue Libraries and School of Information Studies for course assignments and projects.

Brightspace learning management system

- Access the course via Purdue's Brightspace learning management system. Begin with the Start Here tab, which offers further insight into the course and how you can be successful on it. It is strongly suggested that you explore and become familiar not only with the site navigation, but also with the content and resources available for this course. See the Student Services widget on the campus homepage for resources such as Technology Help, Academic Help, Campus Resources, and Protect Purdue.

Learning Outcomes

At the completion of this course, you will:

1. Understand the basics of mapping and geospatial information using ArcGIS Pro.
2. Be able to apply spatial research methods into your own research.
3. Be able to produce professional maps to visualize spatial data.
4. Be able to document and manage spatial data using coherent/standardized way.
5. Understand several spatial analysis methods that are relevant to your research area.
6. Be able to create a web or mobile based GIS application using ArcGIS Online.

Assignments

1. Regular hands-on assignments should be expected for most of the classes.
2. There will be two homework assignments during the semester.
3. One lab-based, open-book midterm exam will be administered at mid-semester.

- Each student will develop and submit a final project, which will become the final examination. The assessment on the final project will be composed of technical accuracy, writing, and an oral presentation of the project. Students have the freedom to choose a project either relevant to their research or a topic of their own interest with the application of knowledge learned from this course. Lab assignments and homework turned in late will be assessed with a 30% reduction penalty.

Grading Scale

Each student will be provided with up-to-date graded feedback at least two times during the term – before the final date to withdraw from the course with a W and at least one week prior to the term’s final exam period, as outlined in the Academic Regulations on [Mid Semester Academic Progress](#).

See the [Fall 2024 Add/Drop calendar](#) and the [2024-2025 Academic calendar](#) for deadlines. For the 16-week fall 2024 course, each student will have up-to-date graded feedback before Tues., Nov. 19 and again before Mon., Dec. 2.

- Grades will be based upon the assigned lab exercises, mid-term examination, homework, final project, and attendance. Grades will be derived from the following chart and are based on the percent of the total scores:

Grade	GPA Value	Range
A+	4.0	97.0-100
A	4.0	93.0 - 96.9
A-	3.7	90.0 - 92.9
B+	3.3	87.0 - 89.9
B	3.0	83.0 - 86.9
B-	2.7	80.0 - 82.9
C+	2.3	77.0 - 79.9
C	2.0	73.0 – 76.9
C-	1.7	70.0 – 72.9
D+	1.3	67.0 – 69.9
D	1.0	63.0 – 66.9
D-	0.7	60.0 – 62.9
F	0.0	< 60.0

- Scores from course assessments and assignments will utilize weighting according to the following distribution:

40% -- Hands-on assignments

30% -- Final project

15% --Midterm exam

10% -- Homework assignments

5% -- Class participation. This will be a qualitative measure determined by the instructor but is primarily based on participation in class discussions, team participation in class projects, and lab project participation. Attendance in class is a part of this grading component.

Attendance Policy

This course follows the [University Academic Regulations regarding class attendance](#), which state that students are expected to be present for every meeting of the classes in which they are enrolled. Attendance will be taken at the beginning of each class.

Excessive absences will endanger your academic performance and will be disruptive to the classroom activities. We will keep attendance records, which will be used to decide “borderline” grades. Unavoidable absences due to illness or an accident may be excused after the fact by written explanation to the instructor specifying the nature of the illness or accident. In the event of absence, it is the student’s responsibility to submit assignments when they are due.

For cases that fall under **excused absence regulations**, you or your representative should contact or go to the [Office of the Dean of Students \(ODOS\) website](#) to complete appropriate forms for instructor notification. Under academic regulations, excused absences may be granted by ODOS for cases of grief/bereavement, military service, jury duty, parenting leave, or certain types of medical care. The processes are detailed, so plan ahead.

Course Schedule

* Schedule and assignments subject to change. Any changes will be posted in the learning management system.

See link to the Purdue [Academic Calendar](#) and key University dates for the semester.

Date	Topic
8/20	Introduction to spatial thinking
8/22	GIS basics
8/27	GIS data models
8/29	Mapping and spatial visualization
9/3	Attribute table manipulation
9/5	Table join and relate
9/10	Spatial manipulation 1
9/12	Spatial manipulation 2
9/17	Creating and editing data
9/19	Research design and data collection strategies
9/24	External data sources, data cleaning
9/26	Geodatabase design and quality control
10/1	Data documentation and management
10/3	Mid-term
10/8	Fall break
10/10	Raster data operation
10/15	Spatial analysis 1
10/17	Spatial analysis 2
10/22	Spatial statistics
10/24	Other GIS platforms
10/29	Web GIS
10/31	Field data collection
11/5	Story mapping
11/7	GIS Day
11/12	Georeferencing

11/14	Adding “time” in GIS
11/19	Network analysis
11/21	Project
11/26	Project
11/28	Thanksgiving Break
12/3	Final Presentation
12/5	Final Presentation

Academic Integrity

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

Dishonesty in connection with any course examinations or class assignments will not be tolerated. The penalty for dishonesty will be zero credit for the examination or assignment and the reporting of dishonest activity to the Office of Student Rights and Responsibilities (OSRR) for review at the university level. Scholastic dishonesty includes, but is not limited to, cheating, use of illegal crib notes, copying during examinations, copying assignments, exercises and computer programs, plagiarism, and knowingly furnishing false information. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is dishonest. In addition, all incidents of academic misconduct will be forwarded to OSRR, where university penalties, including removal from the university, may be considered.

Ethical Use of Generative AI in this Course

Generative AI tools like ChatGPT, Google Gemini, and DALL-E 2 are reshaping many fields, including academia. In this course, you can use GAI for tasks such as editing, translating, generating ideas, visualizing data, and tutoring. While GAI can be a valuable resource, it has limitations and can produce convincing but inaccurate content. Always verify GAI-generated information, especially references and calculations, to ensure accuracy in your learning.

While GAI can enhance your work, misuse can harm your education and professional growth. Therefore, the following guidelines apply to only to this course:

1. Graded Assignments and Exams:

- Do not use GAI for graded assignments or exams unless instructed. Your work should reflect your own thoughts. Violations will be treated as academic dishonesty and may result in disciplinary action.
- Using GAI to refine or paraphrase your work is fine, but core ideas must be original. If GAI helps with outlining, editing, or completing an assignment, cite it and briefly describe its role (e.g., editor, idea generator, data visualization). Failure to cite GAI use is considered plagiarism.

2. Understanding and Enhancing Learning:

- Use GAI to grasp lecture concepts, plan study schedules, generate project ideas, translate text, or refine grammar and writing style.
- Cite GAI usage in assignments. Use it to enhance learning, not to replace critical thinking. Consult your instructor if unsure.

Find information on “Purdue’s Student Guide for Academic Integrity” that links to the [Office of Student Rights and Responsibilities Academic Integrity webpage](#) and a link named “Use of Copyrighted Materials” that links to a [University Policy Office webpage](#).

Nondiscrimination Statement

Purdue University is committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages everyone to strive to reach his or her potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. A link to Purdue’s [Nondiscrimination Policy Statement](#) is included in the Brightspace template under University Policies and Statements content

Accessibility

If you have a disability that requires some special accommodation, please make an appointment with me within the first two weeks of the semester to discuss the appropriateness of the instructional methods in this class, or any academic adjustments that you may need. I have found it possible to make accommodations in the past, but it is important that we talk about this at the beginning of the semester.

Mental Health/Wellness Statement

If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try [Therapy Assistance Online \(TAO\)](#), a web and app-based mental health resource available courtesy of Purdue Counseling and Psychological Services (CAPS). TAO is available to all students at any time by creating an account on the [TAO Connect website](#), or downloading the app from the App Store or Google Play. It offers free, confidential well-being resources through a self-guided program informed by psychotherapy research and strategies that may aid in overcoming anxiety, depression and other concerns. It provides accessible and effective resources including short videos, brief exercises, and self-reflection tools.

If you need support and information about options and resources, please contact or see the [Office of the Dean of Students](#). Call 765-494-1747. Hours of operation are M-F, 8 a.m.- 5 p.m.

If you find yourself struggling to find a healthy balance between academics, social life, stress, etc., sign up for free one-on-one virtual or in-person sessions in West Lafayette with a [Purdue Wellness Coach at RecWell](#). Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is free and can be done on BoilerConnect. Students in Indianapolis will find support services curated on the [Vice Provost for Student Life website](#).

If you’re struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact [Counseling and Psychological Services \(CAPS\)](#) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS offices in [West Lafayette](#) or [Indianapolis](#).

Emergency Preparedness

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

A link to Purdue’s Information on [Emergency Preparation and Planning](#) is located on our Brightspace under “University Policies and Statements.” This website covers topics such as Severe Weather Guidance,

Emergency Plans, and a place to sign up for the Emergency Warning Notification System. I encourage you to download and review the [*Emergency Preparedness for Classrooms document*](#).

Following Purdue's required [Emergency Preparedness Briefing](#), please make note of items like:

- The location to where we will proceed after evacuating the building if we hear a fire alarm.
- The location of our Shelter in Place in the event of a tornado warning.
- The location of our Shelter in Place in the event of an active threat such as a shooting.