

USP 452: GIS for Community Development

Nohad A. Toulan School of Urban Studies & Planning
Portland State University
Fall 2023

Hours: Mondays and Wednesdays from 10:00 am to 11:50 am.

Location: This class meets in person at Fariborz Maseeh Hall, Room B157.

Instructor

Yu Xiao, Ph.D., AICP., Associate Professor Email: yxiao@pdx.edu

Office hours: by appointment

Teaching Assistant: Mina Kim

Slack channel: <https://usp452fall2023.slack.com>

Credits: 4 undergraduate hours

Course Website: This course uses Canvas (canvas.pdx.edu) in support of learning. You can log in with your Odin username and password.

Course Description and Objectives

This course provides an overview of the use, application, and representation of geographic data for community development. The course is designed for students interested in the theoretical foundations and practical applications of spatial thinking. Combining assigned readings, lectures, lab exercises and assignments, this course aims to help students develop an understanding of how spatial thinking can support the decision-making processes in the field of community development.

Specifically, the goals are to help students:

- Through readings and lectures to understand the theories in geographic information and characteristics of spatial information, and grasp basic concepts supporting spatial thinking and spatial analysis in community development and planning.
- Through lab exercises, assignments, and project work to develop basic skills, including using GIS software, for the uses of geographic information systems in community development and planning.

Skills you will develop in this course include:

- Problem solving: Analytical capacities to integrate spatial data into community development;

- Communication: A coherent, thoughtful presentation of analysis in written, graphical, and verbal formats;
- Team work: Develop interpersonal communication while working in teams.

Textbooks

Required textbook for lab sessions:

Kurland, Wilpen L. Gorr, Kristen S. *GIS Tutorial for ArcGIS Pro 2.8*. (4th Edition). Esri Press, 2021. Available from: Portland State University Bookstore, VitalSource (<https://www.vitalsource.com>), etc.

It is very important for you to obtain this textbook before our first class on September 27 because you will need it for the lab exercises on that day.

Textbook (open access): Yiping Fang, Vivek Shandas, and Eugenio Arriaga. *Spatial Thinking in Planning Practice: An Introduction to GIS*. <http://pdxscholar.library.pdx.edu/pdxopen/4/>

Other reading materials will be provided by the instructor on the Canvas course website.

Computer/Software Access

Signing In ArcGIS Pro

If you already have a PSU ArcGIS Online account and a valid ArcGIS Pro license through the PSU AGO, then follow the steps below to sign in to ArcGIS Pro. If you don't have a PSU ArcGIS Online account or a valid ArcGIS Pro license, then see the "Activating an ArcGIS Pro License" section below.

1. Start ArcGIS Pro.
2. Click on "Your ArcGIS organization's URL" link on the logon dialog window.
3. Enter "**pdxedu**" as the prefix to the ArcGIS organization's URL. Click "CONTINUE."
4. Click on "PORTLAND STATE" button and log on with your PSU ODIN account credential.

Activating an ArcGIS Pro License

ArcGIS Pro is currently authenticated through PSU ArcGIS Online Portal. Users need to logon to PSU ArcGIS Online to activate their ArcGIS Account. See [the ArcGIS Online page](#)[Links to an external site.](#) for information about using the PSU ArcGIS Online Portal.

Access ArcGIS Pro via Virtual Computer Lab (VLAB): Please follow the directions to access VLAB: <https://portlandstate.atlassian.net/servicedesk/customer/portal/2/topic/4ee04a3f-7d9e-417a-9831-a8d879d4701b/article/885653584>[Links to an external site.](#)

Additional GIS Resources for PSU Students: [GIS Software \(google.com\)](#)[Links to an external site.](#)

Data for the labs are stored at: I:\Students\Data\GIS\ArcGIS Exercises\ArcGIS_Pro_2.x. You cannot make changes to the I:\ drive. Please copy the data to your local H:\ drive to complete the tutorials and assignments.

COURSE WORK

In general, the course will take the form of lectures plus lab sessions. Lectures will be on Mondays, and Wednesdays will provide lab-time for hands-on use of the ArcGIS Pro software. There are a series of activities that are expected to be completed in this course including assigned readings, lectures, lab exercises & assignments, a midterm exam, and a final project. The following is a general introduction of each activity.

Class Participation: Lectures on each Monday provide an opportunity for students to learn about the theoretical foundations, historical developments, and applications of geographic analysis to community development. It encourages a collaborative learning environment among the group.

Labs: Lab tutorials and assignments enable students to work directly with the software and address 'real-world' problems. Students will follow the textbook *GIS Tutorial for ArcGIS Pro 2.8* in the lab sessions. You need to go through the tutorials in the book in order to learn the skills for completing the assignments. While you might have an opportunity to work on assignments during the lab sessions, in most cases you will be expected to complete the assignments using outside-class hours. The submission of the assignments are due on the Canvas website.

Data for the labs are stored at: I:\Students\Data\GIS\ArcGIS Exercises\ArcGIS_Pro_2.x. You cannot make changes to the I:\ drive. Please copy the data to your local H:\ drive to complete the tutorials and assignments.

Midterm Exam: One online exam will be conducted through the Canvas website. The midterm exam will test the major concepts you've learned in this course. If you've come to class, paid attention, and done well on all the assignments you should have little trouble with the exam. The exam is designed to ensure that you are on track with the basic principles of GIS so that you will be prepared to complete the project and can stay on schedule for the remainder of the course.

Final Project: You will work in teams to solve problems with the knowledge and skills you acquired in this course. The details of this project will be given in the sixth week.

Grading

You will be evaluated on a 150 point scale, divided into the following criteria:

Lab Assignments (10 points x 7): 70

Midterm Exam	30
Final Project:	<u>50</u>
TOTAL:	150

Course grades will be assigned on a criterion-reference scale as follows:

A: 93-100% A-: 90-92%
 B+: 87-89% B: 83-86% B-: 80-83%
 C+: 77-79% C: 73-76% C-: 70-72%
 D+: 67-69% D: 63-66% D-: 60-62%
 F: <60%

In case that a grade is on the borderline, classroom participation will be used to determine the final grade.

COURSE POLICIES

Attendance

Students are expected to attend every class. To be excused, the student should notify the instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible (e.g. accident, or emergency) the student should provide notification by the end of the second working day after the absence. This notification should include an explanation of why notice could not be sent prior to the class.

Classroom participation

Students are encouraged to come to class prepared, make thoughtful contributions to class discussions, respect others' views, and help each other out in collaborative learning groups.

Assignment guidelines

Students are encouraged to have study groups and help each other with the assignments. However, the assignments designated as individual work should be done as individual work. Plagiarism will be prosecuted.

Late Submission Policy

In fairness to all students, especially those who work hard to meet deadlines, late assignments will be penalized 10% per day.

Academic Integrity Statement

PSU's Student Code of conduct prohibits "All forms of academic dishonesty, cheating, and fraud, including but not limited to: (a) plagiarism, which includes, but is not limited to, word for word copying, using borrowed words or phrases from original text into new patterns without attribution, or paraphrasing another writer's ideas; (b) The buying and selling of all or any portion of course assignments and research papers; (c) Performing academic assignments (including tests and examinations) for other persons; (d) Unauthorized disclosure and receipt of academic information; and (e) Falsification of research data."

Access and Inclusion for Students with Disabilities

PSU values diversity and inclusion; My goal is to create a learning environment that is accessible, equitable, inclusive, and welcoming. I am committed to fostering mutual respect and

full participation for all students. If any aspects of instruction or course design result in barriers to your inclusion or learning, please notify me. Additionally, the Disability Resource Center (DRC) provides reasonable accommodations for students who encounter barriers in the learning environment. The DRC works with students who have physical, learning, cognitive, mental health, sensory, and other disabilities.

If you have, or think you may have, a disability that may affect your work in this class and feel you need accommodations, contact the Disability Resource Center to schedule an appointment and initiate a conversation about reasonable accommodations.

If you already have accommodations, please contact me to make sure that I have received your faculty notification letter from the DRC so we can discuss your accommodations.

The DRC is located in 116 Smith Memorial Student Union, Suite 116. You can also contact the DRC at 503-725-4150 or, drc@pdx.edu. Visit the DRC online at <https://www.pdx.edu/disability-resource-center>.

Title IX Reporting Obligations

Portland State is committed to providing an environment free of all forms of prohibited discrimination and sexual harassment (sexual assault, domestic and dating violence, and gender or sex-based harassment and stalking). If you have experienced any form of gender or sex-based discrimination or sexual harassment, know that help and support are available. Information about PSU's support services on campus, including confidential services and reporting options, can be found on PSU's Sexual Misconduct Prevention and Response website at: <http://www.pdx.edu/sexual-assault/get-help> or you may call a confidential IPV Advocate at 503-725-5672 or schedule Online at <https://psuwrc.youcanbook.me>. You may report any incident of discrimination or discriminatory harassment, including sexual harassment, to:

- PSU's Title IX Coordinator: Julie Caron by calling 503-725-4410, via email at titleixcoordinator@pdx.edu or in person at Richard and Maureen Neuberger Center (RMNC), 1600 SW 4th Ave, Suite 830
- Deputy Title IX Coordinator: Yesenia Gutierrez by calling 503-725-4413, via email at yesenia.gutierrez.gdi@pdx.edu or in person at RMNC, 1600 SW 4th Ave, Suite 830

Please be aware that all PSU faculty members and instructors are required to report information of an incident that may constitute prohibited discrimination, including sexual harassment and sexual violence. This means that if you tell me about a situation of sexual harassment or sexual violence that may have violated university policy or student code of conduct, I have to share the information with my supervisor, the University's Title IX Coordinator or the Office of the Dean of Student Life. However, the Title IX Coordinators will keep the information confidential and refer you to a confidential advocate.

Submitting work online

For assignments that require uploading files to Canvas, it is the student's responsibility to verify that (1) all files are submitted in Canvas prior to the deadline and (2) all submitted files are those that the student intends to be graded for the assignment. Submitting the "wrong" file by accident is not acceptable grounds for a deadline extension. Assignment grades will be based on the file submitted prior to the posted deadline. Files submitted in a format that cannot be accessed by the instructor cannot be graded and will therefore receive a 0. Acceptable file formats are MS Office formats (e.g. Word, Excel, Powerpoint) or PDF files. Individual assignment instructions may contain a required file format.

Technology access

Proficiency in the use of Canvas, PSU email, and other computer tools such as ZOOM or part of google suite is required for this course. This course requires consistent access to functioning computer equipment and Internet access throughout the length of the course. Reliance on a cellular connection may not provide reliable and fast access to online learning resources. Here are some broadband programs that are free or low-cost:

<https://www.highspeedinternet.com/resources/are-there-government-programs-to-help-me-get-internet-service>

CALENDER AND READINGS

Week	Mondays (Lecture)	Wednesdays (Labs)	Assignment Due before Wed. Lab
1		<p>(9/27) GIS in Community Development</p> <p>Chapter 1, Spatial Thinking in Planning Practice: An Introduction to GIS</p> <p>Chapter 1 (Tutorial 1-1 to Tutorial 1-4 are required, Tutorial 1-5 and Tutorial 1-6 are optional)</p> <p>Assignment 1-1: Analyze the change in population by county in the United States from 2000 to 2010</p>	
2	<p>(10/2) Map Design</p>	<p>(10/4) Chapter 2 (All Tutorials), Chapter 3 (Tutorials 3-1 and 3-2 are required; Tutorials 3-3 and 3-4 are optional)</p> <p>Assignment 3-1: Build a layout with income versus educational attainment in Washington, DC.</p>	<p>Assignment 1-1 due</p>

3	<p>(10/9) Types of GIS Data, Topology</p> <p>Chapters 2 and 3, Spatial Thinking in Planning Practice: An Introduction to GIS</p>	<p>(10/11) Chapter 4 (All Tutorials)</p> <p>Assignment 4-2: Compare serious violent crime with poverty in Pittsburgh.</p>	Assignment 3-1 due
4	<p>(10/16) Map Projection, Census Data</p> <p>Chapter 4, Spatial Thinking in Planning Practice: An Introduction to GIS</p>	<p>(10/18) Chapter 5 (All Tutorials)</p> <p>Assignment 5-1 Compare heating fuel types by US counties.</p>	Assignment 4-2 due
5	<p>(10/23) Geoprocessing</p>	<p>(10/25) Chapter 6 (All Tutorials)</p> <p>Assignment 6-3 Dissolve property parcels to create a zoning map.</p>	Assignment 5-1 due
6	<p>(10/30) Data Collection and Geocoding</p> <p>Chapter 7, Spatial Thinking in Planning Practice: An Introduction to GIS</p> <p>Midterm Exam [on Canvas]</p> <p>Discuss final project</p>	<p>(11/1) Chapter 7 (All Tutorials) and Chapter 8 (All Tutorials)</p> <p>Assignment 8-1 Geocode grocery stores in Allegheny County.</p>	Assignment 6-3 due
7	<p>(11/6) Spatial Analysis</p>	<p>(11/8) Chapter 9 (All Tutorials)</p> <p>Assignment 9-1 Study California cities affected by earthquakes.</p>	Assignment 8-1 due
8	<p>(11/13) Advanced GIS Analysis (3D Analyst, Network Analyst, etc.)</p> <p>Final project work plan due</p>	<p>(11/15) Work on Final Project</p>	Assignment 9-1 due
9	<p>(11/20) Open Source GIS, Participatory GIS</p>	<p>(11/22) Work on Final Project</p>	
10	<p>(11/27) Project Presentation</p> <p>Final project presentation slides due</p>	<p>(11/29) Project Presentation</p>	Final project report due on Friday, 12/1 at midnight