Course Syllabus

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USP 531: GIS for Planners

Nohad A. Toulan School of Urban Studies & Planning

Portland State University

Spring 2024

Hours: Mondays and Wednesdays from 9:00 am to 10:50 am.

Location: This class uses a hybrid delivery method, meeting
- via zoom **https://pdx.zoom.us/j/5037255130** ⤷ **(https://pdx.zoom.us/j/5037255130)** or
- in person (FMH-B155)

Instructor: Liming Wang, PhD, Associate Professor
Email: **lmwang@pdx.edu (mailto:lmwang@pdx.edu)**

Office Hours: Mondays 1-3 pm, in person (URBN 350D), **zoom** ⤷ **(https://pdx.zoom.us/j/5037255130)** , or **slack** ⤷ **(https://usp531.slack.com)** .

Teaching Assistant: Mina Kim
Email: kimmin@pdx.edu

Slack channel: https://usp531.slack.com

Credits: 4 graduate hours
Course Website: This class uses Canvas (canvas.pdx.edu). You can log in with your PSU Odin username and password.

Class Description and Objectives

Geographic Information Systems (GIS) for Planners provides an overview of the use, application, and representation of geographic data specific to urban and regional planning. The course is designed for students interested in the theoretical foundations and practical applications of spatial analysis. The course will provide the framework for meeting several learning objectives through in-class discussions, 'take-home' exercises, and participant presentations. You are expected to develop critical thinking skills to evaluate spatial analytical methods and representations of spatial data. As future planners, critically

examining spatial data will be central to your ability to address challenges in urban and regional planning. Other skills you will develop in this course include:

- Problem solving: Analytical capacities to integrate spatial data into the planning process;
- Research design: Craft a study using spatial analysis to address one problem from the field of urban and regional planning;
- Communication: A coherent, thoughtful presentation of analysis in written, graphical, and verbal formats;
- Group work: Develop interpersonal communication while working in teams; and
- Application for practice: Students are expected to understand how spatial data differ from other types of data, what types of spatial data to use and when, what methods of analysis to apply and why, and how to represent results to urban and regional planners and other audiences.

Text Books

Required textbook for lab sessions:

- Wilpen L. Gorr, Kristen S. Kurland, *GIS Tutorial for ArcGIS Pro 3.1*. Available from: VitalSource Bookshelf. Esri Press, 2023.

Additional Textbook (open access): Yiping Fang, Vivek Shandas, and Eugenio Arriaga. *Spatial Thinking in Planning Practice: An Introduction to GIS* (http://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1004&context=pdxopen) . http://pdxscholar.library.pdx.edu/pdxopen/4/ (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 log on to PSU ArcGIS Online to activate their ArcGIS Account. See **the ArcGIS Online page (https://sites.google.com/pdx.edu/gis-software/arcgis-online)** for information about using the PSU ArcGIS Online Portal.

PSU ArcGIS Online account activated after July 1, 2019 will have access to ESRI E-Learning and an ArcGIS Pro license assigned to the account automatically. There is no need to submit further requests. If your PSU ArcGIS Online account was activated before July 1, 2019 and that you have verified that you don't have an ArcGIS Pro license attached to your PSU ArcGIS Online account, then, after your AGO account is activated, please send your PSU ArcGIS Account ID (i.e., odin ID with _pdxedu suffix) to Geoffrey Duh (jduh@pdx.edu) to request an ArcGIS Pro license.

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 (https://portlandstate.atlassian.net/servicedesk/customer/portal/2/topic/4ee04a3f-7d9e-417a-9831-a8d879d4701b/article/885653584)**

 Install ArcGIS Pro on your own computer (for Windows Operating System Only): You can download ArcGIS Pro installation programs **here.** ⬀ **(https://drive.google.com/drive/folders/1x7ukxjNXEZ4cVuD8jLqvmdZKDKfag2YP?usp=sharing)** You need to log on to your PSU ODIN account to access the Google share folder. Go to ArcGISPro -->ArcGISPro_31_184994.exe. Download the file and install it.

Additional GIS Resources for PSU Students: **GIS Software (google.com) (https://sites.google.com/pdx.edu/gis-software/)**

 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 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.

Labs: Lab tutorials and assignments enable students to work directly with the software and address 'real-world' problems. Students will follow the book *GIS Tutorial for ArcGIS Pro 3.1* in the lab sessions. You need to go through the tutorial in the workbook to learn what you need for 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 assignments are due on the Canvas website.

Data for the labs are stored at:

https://drive.google.com/drive/folders/1AILWUUUJo0wTlN0AfOMopBdDWwzguvov ↗ (https://drive.google.com/drive/folders/1AILWUUUJo0wTlN0AfOMopBdDWwzguvov) . Please download the data to your local drive for use with the tutorials.

You can also download the data directly from ESRI: https://links.esri.com/GISTforPro3.1Data ↗ (https://links.esri.com/GISTforPro3.1Data)

Midterm Exam: One online exam will be conducted through the Canvas website. The midterm exam will test the major concepts you've learned in class, and also require that you apply what you've learned in the assignments. If you've come to class, paid attention, and done well on all the assignments you will 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 class.

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

Grading

This class is cumulative skill learning, that is, the effort you put into completing all the assignments and exercises will be helpful in passing the midterm exam and completing the final project.

Assessment Criteria: You will be evaluated on a 150 point scale, divided into the following parts:

Lab Assignments (10 points x 7):	70
Midterm Exam	30
Final Project:	50
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 must notify his or her 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 must 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. Students must provide additional documentation substantiating the reason for the absence that is satisfactory to the instructor, within one week of the last date of the absence. The instructor will either provide the student an opportunity to make up any graded activities or provide a satisfactory alternative to be completed within 30 calendar days from the last day of the absence.

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 work submitted must be 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 5% per day. Assignments more than 7 days late will not be accepted.

CALENDER AND READINGS (tentative)

Week	Mondays (Lecture)	Wednesdays (Labs)	Assignment Due before Wed. Lab

1	**(4/1) Introduction; Overview**	**(4/3) Chapter 1 (All Tutorials)** Assignment 1-1: Analyze the change in population by county in the United States from 2000 to 2010	
2	**(4/8) Map Design** Reading: Chapter 1: Defining a Geographic Information System	**(4/10) Chapter 2 (All Tutorials)** **Chapter 3 (All Tutorials)** **Assignment 3-1: Build a layout with income versus educational attainment in Washington, DC.**	Assignment 1-1 due
3	**(4/15) Types of GIS Data, Topology** Reading: Chapter 3: Topology and Creating Data	**(4/17) Chapter 4 (All Tutorials)** Assignment 4-2: Compare serious violent crime with poverty in Pittsburgh.	Assignment 3-1 due
4	**(4/22) Map Projection, Census Data** Reading: Chapter 2: Coordinate Systems and Projecting GIS Data	**(4/24) Chapter 5 (All Tutorials)** Assignment 5-1 Compare heating fuel types by US counties.	Assignment 4-2 due
5	**(4/29) Geoprocessing** Reading: Chapter 8 Data manipulation	**(5/1) Chapter 6 (All Tutorials)** Assignment 6-3 Dissolve property parcels to create a zoning map.	Assignment 5-1 due

6	**(5/6) Data Collection and Geocoding** Readings: Chapter 7 Digitizing Chapter 8 Geocoding **Midterm Exam [on Canvas]** **Start final project**	**(5/8) Chapter 7 (All Tutorials) and Chapter 8 (All Tutorials)** Assignment 8-1 Geocode grocery stores in Allegheny County.	Assignment 6-3 due
7	**(5/13) Spatial Analysis** Reading: Chapter 9 Spatial Analysis	**(5/15) Chapter 9 (All Tutorials)** Assignment 9-1 Study California cities affected by earthquakes.	Assignment 8-1 due
8	**(5/20) Advanced GIS Analysis** Reading: TBA Final project work plan due	**(5/22) Work on Final Project**	**Assignment 9-1 due**
9	**(5/27) Online Mapping; Planning support** **Reading: TBA**	**(5/29) Work on Project**	
10	**(6/3) Open Source GIS, Participatory GIS** **Reading: TBA**	**(6/5) Work on Project**	
11	**(6/10) Project Presentation** Final project presentation slides due before class		Final project report due on Friday, 6/14

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 (mailto:drc@pdx.edu)**. Visit the DRC online at **https://www.pdx.edu/disability-resource-center (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 (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 (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