SYLLABUS – USP 531 – WINTER 2014

Course Info: USP 531: GIS for Planners* (CRN 44230, 4 Credit Hours)
Monday: URBN 220, 2 – 3:50PM (Lectures)
Wednesday: Neuberger Hall 450, 2 – 3:50PM (Lab Sessions)

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Office Hours & Location:
Wednesdays 12 – 2PM and by appointment.
Urban Center (URBN) 370L

Teaching and Lab Assistant (TA): TBD
Lab Hours for the TA *(URBN 225):* TBD

Course 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, historical developments, 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. First and foremost, 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
- Community engagement: Collaborate with community organizations to address an urban and regional planning issue.

In addition and more pragmatically, 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.

* *Working Syllabus: While the learning objectives and core requirements will not change over the term, there may be minor modifications to assignments, order of presentations, and timing of topics. Modifications will be described in class and students are required to be up-to-date on any changes. Last change: January 6th, 2014.*

Required Readings and Materials

I. Gorr. WL., KS Kurland, 2012. GIS Tutorial: Basic Workbook for ArcGIS 10.1, ESRI Press.[1]
II. Weekly articles posted on D2L.
III. Electronic storage device (e.g. memory card, flash drive) adaptable to a USB port and a minimum storage capacity of 1 gigabyte.

Recommended Readings

I. LeGates, R., 2006. GIS for the Urban Environment, ESRI Press.
II. Peters, A., and H MacDonald, 2004. Unlocking the Census with GIS. ESRI Press.
III. Tufte, ER., 1997. Visual and Statistical Thinking: Display of Evidence for Making Decisions. Graphics Press.

The Basics

In general, the course will be divided into lecture and lab sessions. Mondays will consist of lecture, and Wednesdays will provide lab-time for hands-on use of software. Lectures will generally begin with a warm-up exercise. Warm-up exercises are intended to stimulate thinking about a specific topic, and develop critical thinking skills. Lectures provide an opportunity for students to learn about the theoretical foundations, historical developments, and applications of geographic analysis to urban and regional planning. Lab sessions enable students to work directly with the software and address 'real-world' problems in urban and regional planning. A basic understanding of Windows© operating system, including Microsoft Word and Excel, will be helpful in working with the datasets used in this course. While you will have an opportunity to work on assignments during the lab sessions, in most cases you will be expected to complete homework (e.g. assignments and presentation) outside class hours.

This course uses Environmental Systems Research Institute's (ESRI) *ArcGIS 10.x* spatial analysis software for assignments and final project. If you choose, you can receive a complementary copy of *ArcGIS 10.x* (one-year expiration) to load onto your personal computer. You also have access to all the computer labs on campus, all of which have the most recent version of ArcGIS installed. Please make sure to abide by all the rules and regulations of campus computing labs – misusing equipment, software, or data will result in loss of privileges.

Every effort will be made to accommodate individuals with disabilities. Please notify the instructor by the first week of the course so that any necessary accommodations can be arranged. More information can be found at:

http://www.pdx.edu/iasc/drc_faculty_resources.html

[1] *Available at the PSU bookstore. Please do not order on-line because orders can take up to 4 week for delivery and can cause delays in completing assignments. Also, previous editions of GIS Tutorial exist, but for this course we will be using the *Workbook for ArcGIS 10**.

Evaluation Criteria

You will be evaluated on a 1000 point scale, divided into the following criteria:

Assignments (400 points):	***40%***
Midterm Exam (200 points):	***20%***
Leading Discussion (100 points):	***10%***
Course Participation (100 points):	***10%***
Final Project (200 points):	***20%***
TOTAL (1000 POINTS)	**100%**

Late work will be automatically marked down unless prior arrangements have been made with the instructor. Regular class attendance is necessary and expected. Participation includes: involvement with class discussions (includes listening), asking substantive questions, addressing instructor's questions, and working effectively in teams.

Assignments, Midterm, and Project

To pass this course you will need to complete all assignments, lead a discussion a peer-reviewed journal article, and pass the midterm exam and final project. All requirements are intended to complement one another – for example, while assignments use general datasets from pre-packaged sources, the skills you acquire will be essential to manage datasets used in your final project. This class is cumulative, assuming that the effort you put into completing all the assignments and exercises will be helpful in passing the midterm exam and completing the final project.

ASSIGNMENTS: The instructor will provide a background to the assignment in lab session, and participants are expected to submit assigned work by the beginning of the following Wednesday class (one week). The attached 'Course Outline' table provides a brief description of and due-dates for assignments, midterm exam and final project. To submit the assignments please take a 'screen capture' (Cntl+Alt+Print Screen) of the final map produced and paste onto a MS Word document. Submit these assignments as in PDF format. *Note that pasting the final product onto an MS Word document is different than the instructions provided in the workbook.* Be sure to clearly identify which portion of the assignment you are submitting.

MIDTERM: The midterm exam and final project will cover all the major concepts you've learned in class, and 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 no trouble with the midterm exam. The midterm exam is designed to ensure that you are on track with the basic principles of GIS such that you will be prepared to complete the project and can stay on schedule for the remainder of the class. Some details on the midterm:

Midterm Exam – *Wednesday, February 10*

- Covers the first five weeks, including lectures, assignments, readings and discussions -- a brief review of the midterm will occur one week prior;
- This will be an in-class exam, with short-answers and technical questions.

FINAL PROJECT: You are expected to work in a team (2 - 4 members) to: (1) identify an urban & regional planning problem requiring spatial analysis; (2) collaborate with your team members to develop a research question; (3) conduct analysis to address the research question; (4) present your project; and (5) submit a final report detailing your analysis, and findings. Consider working with a regional organization that could benefit from spatial analysis, and apply your GIS techniques to the needs of an organization.

Completion dates and description for the final project are provided below. While the instructor will provide feedback on project elements, *these submissions will not be graded, and each group is responsible for communicating their ideas with the instructor as needed*. The purpose of these submissions is to ensure that you are on-track with completing the final project.

- Project Idea – *January 13 through 27*
  - No more than one page
  - Brief background
  - State the core *research question*
- Initial Data Acquisition – *February 3*
  - List Data Sources, and *for each*, state the following:
    - How data tie to your research question;
    - What is the source of the data;
    - How the data are measured; and
    - What spatial data models fit
  - Also discuss any missing or problem data sources you have.
- Project Design & Methodology – *February 17*
  - A flowchart identifying data sources and analysis at all steps.
  - A short narrative (~half-page) describing how your methodology accomplishes your objective.
- Data Analysis – *February 24*
  - Finish your data analysis by this point.
  - Check-in with Instructor about findings and report structure
- Conclusions – *March 3*
  - Develop conclusions for your project and revisit any changes necessary.
- Presentation – *March 17 (regular class time)*
  - 15 minutes per presentation (13min. + 2min. questions)
  - Focus on the following elements of your project:
    - Background/Research Question
    - Data/Methodology
    - Summary of Results
    - Interpretation of Results
    - Limitations of analysis
  - Final project presentations will be evaluated on content (40%), organization (40%), and effective communication (20%).

- Final Report – *March 19 (by 5PM, submitted on D2L)*
    - A final report might include the following sections:
        - *Introduction/Background* - What should your audience know about the subject matter to help them understand the topic and the reason for doing your project?
        - *Problem Statement* - Where is the gap in current knowledge, what is your question, and how does your question serve to fill this gap?
        - *Data Summary* (include a map for each of your major GIS data sources) - Where do your data come from? What attributes are contained, and what quality are the data. *Note on data sources: PSU I-drive is not a data source - it's a collection, or a repository, or an archive, but it does not provide any original data. When you talk about your sources, you'll need to say where the data came from (hint: look at the metadata).*
        - *Methodology* - Reflects what you *actually* did – be sure to identify steps using appropriate language.
        - *Analysis Results* (include at least one map here) - Summarize your key findings in relatively objective terms.
        - *Conclusions* - What do your findings say about your research question? How do they inform the knowledge-gap you identified earlier? In what ways do your analysis and findings fall short of being a definitive answer?
    - In terms of length, reports should be no more than 20 pages (double-spaced, 12-point font, including figures, but not bibliography or appendices).

Web-Based Course Management

We will be using D2L, an online course management system used extensively at PSU. Course participants will need to use D2L for meeting several course requirements, including keeping up with updates to the syllabus, downloading readings, and uploading assignments. D2L also has a forum on which participants can post course-related messages. D2L is located at: www.psuonline.pdx.edu. To sign on to Blackboard you will need a PSU user identification and password.

Academic Integrity

Portland State University (PSU) takes academic integrity very seriously. PSU strives to provide students with the knowledge, skills, judgment, and wisdom they need to function in society as educated adults. To falsify or fabricate the results of one's research; to present the words, ideas, data, or work of another as one's own; or to cheat on an examination or project corrupts the essential process of higher education. Students failing to adhere to these principles of academic integrity will be penalized. For further information please refer to PSU's student conduct code (http://www.pdx.edu/dos/conduct.html) or consult the instructor if you are unsure what constitutes a breech of academic integrity.

Course Outline

MODULE	Module Objectives	Week	Week & Date	Due on Monday	Monday Lecture	Due on Wednesday	Wednesday Lab
1	Learn principles of geographic analysis; Work directly with software; Consider applications to urban & regional planning	**1**	Jan 6 & 8		Course overview, GIS defined,software systems; data models	Media Article using Maps	Tutorial 1 & 2 (Introduction & Map Design)
		2	Jan 13 & 15	Project Idea; Readings 1	Georeferencing, GPS, Datum, Projections, Database structures, Topology	Assignment 1 (Map Design, 2-1, 2-2)	Tutorial 3 & 4 (GIS Outputs & Geodatabases)
		3	Jan 20 & 22	Group Formation; Readings 2	**MLK Holiday - No Class**	Assignment 2 (Geodatabases, 4-1, 4-2)	Continue Topology; Tutorials 5 (Spatial Data)
2	Learn to evaluate quality of spatial data; Understand spatial analysis techniques; Work with actual data; Develop research application	**4**	Jan 27 & 29	Group project idea; Readings 3	Creating and manipulating spatial data, Creating new data, US Census Intro	Assignment 3 (Spatial Data 5-1, 5-2)	Tutorial 6 (Geoprocessing)
		5	Feb 3 & Feb 5	Project data sources; Readings 4	Geographic data quality and data standards, Spatial autocorrelation	Assignment 4 Due (Geoprocessing 6-1, 6-2)	Tutorial 8 (Geocoding) Review for Midterm
		6	Feb 10 & 12	Review for Midterm	**Midterm**	Assignment 5 Geocoding 8-1, 8-2)	Tutorial 9 (Spatial Analysis)
3	Learn to apply spatial analysis techniques to challenges in urban & regional planning	**7**	Feb 17 & 19	Project design & methodology; Readings 5	Spatial Analysis (overlay analysis, 3D Analysis)	Assignment 6 Due (Spatial Analysis 9-1, 9-2)	Tutorial 10 (ArcGIS 3D))
		8	Feb 24 & 26	Project data analysis; Readings 6	Raster Models, TINs, Model Builder	Assignment 7 (3D Analyst 10-1; 10-2)	Spatial Statistics, Advanced modeling
4	Explore project specific extensions as needed; Recognize social and cultural context of spatial data; Presentation of analysis in written and verbal forms; Reflect on principles and applications of GIS	**9**	March 3 & 5	Conclusions; Readings 7	Open source GIS, Planning Support Systems	Assignment 8 (Spatial Analyst, 11-1, 11-2)	Social and Cultural Context
		10	March 10 & 12	Outline for final project: presentation & paper	**No Class -- Prep for Final Projects**	Flow Chart of Final Project (w/ GIS techniques employed)	**No Class -- Prep for Final Projects**
		11	Finals Week -- March 17 & 19	Final Presentations	**Group Presentations (Regular Class Time)**	**Final Reports Due: March 19 by 5PM on D2L**	*Syllabus Updated on January 6, 2013*