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**University of Oregon**

**School of Planning, Public Policy and Management**

**Advanced Urban GIS (4 Credits)  
Spring 2020 (PPPM495/595)**

**Instructors**

Yizhao Yang, Ph.D., Association Professor ([yizhao@uoregon.edu](mailto:yizhao@uoregon.edu))

Teaching Assistant: RJ Theofield (ronaldt@uoregon.edu)

Office hours: Yizhao - Tuesdays 2:00-3:20pm, by appointment, via Zoom meeting or Obaverse virtual classroom

**Course Time and Location**

Lectures: Fridays, 12:00am-12:50am, Obaverse Virtual Classroom

Lab sessions: Fridays, 1:00pm-3:50pm, Obaverse Virtual Classroom

Location: This class will be delivered on Obaverse platform under the name "PPPM 495/595 Advanced Urban GIS (Spring 2020)". Please create an account at <https://www.obaverse.net/>, find the course by searching its name, and enroll.

**Class Overview**

The “Advanced GIS for Community Analysis” class adopts a community-engaged learning approach and centers on projects involving GIS-based analysis on neighborhood walkability, service access equity, urban design quality, etc. It is a mixed-level, applied class, and serves as one of the GIS requirement options for CRP graduate students. This course provides students opportunities to practice GIS mapping and advanced spatial analysis techniques and understand how GIS can be applied to address the environment-people relationship in urban planning. The Advanced GIS class in Spring 2020 centers on a term-long environment analysis project on the Franklin Corridor of Eugene’s Bus Rapid Transit System, EmX. Please see course project description for specific scope of work and work plan of the course project.

The Advanced GIS class not only helps students improve their technical GIS skills but also provides solid opportunities for students to understand evidence-based policy-making process, learn how to work with community stakeholders, and practice professionalism in communication and service delivery. The 400-level of this class is open to undergraduate students who have completed an introductory GIS class (e.g., PPPM434) or have had some experiences using GIS. The 500-level of this class is a required core course for CRP graduate students who have some GIS background and have chosen not to take PPPM534 (Urban GIS). This course can also be taken by graduate students who have completed PPPM534.

**Learning Objectives**

* Understand the relationship between a community’s environmental conditions and residents’ quality of life and a place’s livability; understand how that understanding can inform the policy-making process.
* Learn how to compile existing spatial data, collect primary spatial and non-spatial data using a mobile phone application, and as well as code spatial data.
* Practice GIS mapping and advanced spatial analysis functions,
* Improve public speaking skills and learn to write professional reports.

**Course required textbooks**

There are no required textbooks for this class. Reading materials important for students to complete the class project will be made available during class or on the course Canvas website.

**Evaluation and Grading**

* General course participation (5%)
* Individual assignments (60%)
  + Assignment 1 – Density and sociodemographic analysis (15%)
  + Assignment 2 – Accessibility and street connectivity analysis (20%)
  + Assignment 3 – Land use mix analysis (20%)
  + Exercise – Environment audit instrument development (5%) (Graduate students only)
  + Assignment 4 – Analysis of BRT Ridership and the Station Built Environment Characteristics. (15% UG, 10% G)
* Group assignments (25%)
  + Public presentation (15%)
  + Final report: synthesize all information, compile reports from previous assignments, and add recommendations (10%)

**Grading Rubric**

* C+ and Lower (below 80)
  + **Unacceptable work for professionals or upper level undergraduate/graduate courses**
  + Factual errors or calculation errors
  + Poorly written (misspellings, typos, poor grammar, poor sentence structure)
  + Graphics poor (inaccurate tables, poor titles, no data sources)
* B- (81-83)
  + **Below acceptable standards for professionals**
  + Minor errors of fact or calculation
  + Poorly constructed text, unclear graphics
  + Rushed or lack of attention to overall product
* B (84-86)
  + **Meets minimal professional standards**
  + Factually and technically correct
  + Clear message to readers
  + May lack precision in language and presentation of data
* B+ (87-90)
  + **Solid professional work**
  + Factually and technically correct
  + Excellent tables and graphics
  + Falls short in some areas
* A- (91-94)
  + **High quality professional work**
  + Technically, methodologically, and factually 100% accurate
  + Fall short of highest quality work in organization, flow of text or presentation
  + Clearly conveys conclusions to audience
* A (95-99)
  + **Highest quality work**
  + Technically, methodologically, and factually 100% accurate
  + Efficient language and graphics presented with emphasis
  + Easy to navigate and follow
  + Clear about main points and evidence provided to support these points
  + All graphics are clear and titled, sources, labeled

**Grading Rubric Example (will vary by specific assignment)**

Total Points: 100

Weight: vary by specific assignment

Points included in final grade = Assignment point X Assignment weight

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| Criteria | **Unacceptable professional quality** | **Minimally acceptable professional quality** | **Adequate professional quality** | **Very good professional quality** | **Highest professional quality** |
| **EVALUATION** | | | | | |
| **Addressing each portion of assignment**   * Will vary | 0-8 | 9-11 | 12-14 | 15-17 | 18-20 |
| **Providing adequate analytical evidence**   * Use of literature to present issues and arguments * Use of data, indictors and maps has logic and good justification * Exhibition of higher-level thinking, synthesis and argumentation | 0-20 | 21-25 | 26-30 | 31-35 | 36-40 |
| **Writing (see below)**   * Clearly structured and organized * Professional tone * Grammar, referencing & presentation | 0-20 | 21-25 | 26-30 | 31-35 | 36-40 |

**Course Policies**

Missed Class Policy

You are responsible for all content missed, including any assignments, knowledge or skills covered or assigned in missed class(es.) Please consult with classmates for class notes. You are allowed two unexcused absence in this course. For each unexcused absence beyond the second one, students will lose 10% of their course participation scores (i.e., out of 10 points). Excused absences require official documentation.

Late Assignment Policy

Students are expected to behave in a professional manner and to turn in all materials at the designated time. When applicable, assignments turned in late with no documentation will be marked down ten percent for every day (24-hour period) they are late. Assignments submitted one minute past the deadline will be graded as late.

Extensions will only be granted in severe hardship (death in immediate family, illness or injury requiring bed confinement) or extenuating circumstances (fire, earthquake, etc.). Competing pressures from other courses, job requirements, or problems with your computer do not qualify as extenuating circumstances. Extensions must be requested before the assignment is due. In all circumstances, students are responsible for providing the instructor with official documentation of explanation prior to accommodation.

Academic Misconduct

You are expected at all times to do your own work. Copying or obtaining content from other students or other persons and submitting it as your own work is grounds for failing the class. The University Student Conduct Code (available at conduct.uoregon.edu) defines academic misconduct. Students are prohibited from committing or attempting to commit any act that constitutes academic misconduct. By way of example, students should not give or receive (or attempt to give or receive) unauthorized help on assignments or examinations without express permission from the instructor.

Plagiarism

Students should properly acknowledge and document all sources of information (e.g. quotations, paraphrases, ideas, data, analyses). If there is any reasonable question about whether an act constitutes academic misconduct, it is the student’s obligation to clarify the question with the instructor before committing or attempting to commit the act. Additional information about a common form of academic misconduct, plagiarism, is available at: http://library.uoregon.edu/guides/plagiarism/students/index.html

Documented Disability

If you have a documented disability and anticipate needing accommodations in the course, please make the necessary arrangements. You may contact Disabilities Services at 541-346-1155. Also, please contact the instructor early in the semester so that your learning needs are appropriately met.

**Inclusion Statement**

The College of Design is a community that values inclusion. We are a committed to equal opportunities for all faculty, staff and students to develop individually, professionally, and academically regardless of ethnicity, heritage, gender, sexual orientation, ability, socio-economic standing, cultural beliefs and traditions. We are dedicated to an environment that is inclusive and fosters awareness, understanding, and respect for diversity. If you feel excluded or threatened, please contact your instructor and/or department head. The University Bias Response Team is also a resource that can assist you. Find more information at their website at http://bias.uoregon.edu/index.html or by phoning 541-346-2037.

Discrimination and Sexual Harassment

The UO is committed to providing an environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic and dating violence and gender-based stalking. If you (or someone you know) has experienced or experiences gender-based violence (intimate partner violence, attempted or completed sexual assault, harassment, coercion, stalking, etc.), know that you are not alone. UO has staff members trained to support survivors in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more. Please be aware that all UO employees are required reporters. This means that if you tell me about a situation, I may have to report the information to my supervisor or the Office of Affirmative Action and Equal Opportunity. Although I have to report the situation, you will still have options about how your case will be handled, including whether or not you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need. If you wish to speak to someone confidentially, you can call 541-346-SAFE, UO’s 24- hour hotline, to be connected to a confidential counselor to discuss your options. You can also visit the SAFE website at safe.uoregon.edu

**Overview of Class Schedule (dates to be updated)**

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| **Week** | **Lecture (12:00 – 12:50)** | **Lab (13:00-15:50)** | **Assignment Due** |
| 1 (4/3) | Course overview  Project overview -Become familiar with the EmX Franklin Corridor and the study area.  Readings:   * (UG and G) Greene, R. J. Pick, Exploring the Urban Community: A GIS Approach (2nd Edition), Pearson Prentice Hall, 2011 Chapter 2 * Review websites about EmX:   + <http://www.movingahead.org/>   + <https://www.ltd.org/system-map/route_103/>   + <https://www.ltd.org/emx-west/>   + <https://cms.fta.dot.gov/sites/fta.dot.gov/files/EmX_FranklinCorridor_BRTProjectEvaluation_0.pdf> (EmX Franklin Corridor - BRT Project Evaluation) | Environment Inventory I (land use analysis and demographic analysis)   * Explore and compile GIS Data * Define study area * ArcGIS refresher   **Assignment 1 given out.** |  |
| 2 (4/10) | Methods of GIS-based place analysis (I)  Using census data to study neighborhoods (Density analysis and sociodemographic analysis)  Readings:   * (UG and G) US Department of Housing and Urban Development, GIS for Housing and Urban Development, accessible at <http://www.nap.edu/catalog.php?record_id=10674> * Edited by Seth Spielman, Ningchuan Xiao, Samantha Cockings, Robert Tanton “Spatial analysis with census data: emerging issues and innovative approaches”. (selected articles) | LTD and EmX Overview (Guest lecture by LTD Representatives)   * Compute indicators for densities. * Examine sociodemographic and housing characteristics within the study area. |  |
| 3 (4/17) | Methods of GIS-based place analysis (II)  Accessibility and Street connectivity analysis  Readings:   * ESRI Network analyst (tutorial exercises) * City of Eugene: 20-minute neighborhood. https://www.eugene-or.gov/506/20-Minute-Neighborhood | **Assignment 2 given out**   * Catchment zone analysis for EmX stations; * Street pattern analysis (connectivity), * Analysis of Accessibility to community services and facilities within the study area. |  |
| 4 (4/24) | Methods of GIS-base place analysis (III)  Land use mix analysis  Readings:   * (G) Knaap, G. , Y. Song, Z. Nedovic-Budic, Measuring Patterns of Urban Development: New Intelligence for the War on Sprawl. * Talen, E. (1998) “Visualizing fairness: equity maps for planners”, *Journal of the American Planning Association;* Winter 1998; 64, 1; pg. 22-38. | **Assignment 3 given out.**   * Compute land use mix indicators for station catchment zones | Assignment 1 due |
| 5 (5/1) | Site observation methods – environment audits  Walkability audit & Safety audit for transit  Readings:   * (UG and G) CDC walkability audit tool - http://www.cdc.gov/nccdphp/dnpao/hwi/downloads/walkability\_audit\_tool.pdf * (UG and G) An Assessment of GIS-Enabled Walkability Audits - http://ppms.otrec.us/media/1211565475SGJJXXE.pdf * (UG and G) <http://www.pedbikeinfo.org/planning/tools_audits.cfm>. * Measuring Walkability: A Note on Auditing Methods   Improving access to transit using road safety audits. | Working session for Assignments 1 -3.  Using Google Street View to practice environment audit. (No on-site data collection)  Audit Instrument Development - Exercise for Graduate students only | Assignment 2 due |
| 6 (5/8) | Site observation methods – environment audits  Urban form and urban design for public space; street walkability and safety  Readings:   * (G) Lee, C and A. Moudon. “The 3Ds + R: Quantifying land use and urban form correlates of walking”. Transportation Research Part D 11 (2006) 204-215. * Review the website for “Project for Public Space” at https://www.pps.org/. * (UG and G) Forsyth, Ann, Mary Hearst, J. Michael Oakes, and Kathryn H. Schmitz. 2008. "Design and destinations: factors influencing walking and total physical activity." Urban Studies 45(9): 1973-1996. * (UG and G) Surveys of pedestrians and bicyclists. 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behavior http://www.nhtsa.gov/nti/811841 | Working session for Assignments 1 -3. |  |
| 7 (5/15) | Ridership of BRT   * US DOT Bus Rapid Transit ridership analysis. <https://nbrti.org/wp-content/uploads/2017/05/WestStart_BRT_Ridership_Analysis_Final.pdf> * Ko Joonho, Kim Daejin, and Etezady Ali. “Determinants of Bus Rapid Transit Ridership: System-Level Analysis.” Journal of Urban Planning and Development 145, no. 2 (June 1, 2019): 04019004. https://doi.org/10.1061/(ASCE)UP.1943-5444.0000506. | **Assignment 4 given out.**  Understand BRT ridership data.  Integrate station-based ridership data with the urban form data for analyses  Analyzing the relationship between EmX Ridership and station environment measures  Start final presentation prep | Assignment 3 due  Audit Instrument Exercise due |
| 8 (5/22) | Ridership and the built-environment of BRT Stations   * Islam, Md Rabiul, Mark Brussel, Anna Grigolon, and Talat Munshi. “Ridership and the Built-Form Indicators: A Study from Ahmedabad Janmarg Bus Rapid Transit System (BRTS).” Urban Science 2, no. 4 (December 2018): 95. * Stewart, Anson F., John P. Attanucci, and Nigel H. M. Wilson. “Ridership Response to Incremental Bus Rapid Transit Upgrades in North America: Demographic and Network Effects.” Transportation Research Record, January 1, 2015. | Working session for Assignments 4.  Final presentation prep |  |
| 9 (5/29) | Project wrap-up and presentation prep | Final presentation prep | Assignment 4 due |
| 10 (6/5) | Final presentation | Presentation due |  |
| 11 | No class | Final report due |  |