UP 505: Urban and Regional Analysis

Fall 2024, Department of Urban and Regional Planning, University of Illinois at Urbana-Champaign

CLASS MEETINGS:	Mondays and Wednesdays, 9:30 am – 10:50 am, TBH 227
INSTRUCTOR:	Bumsoo Lee, bumsoo@illinois.edu
OFFICE HOURS:	11:00 – 11:50 am on Mondays and by appointment, M206
TEACHING ASSISTANT:	Erin Hernandez, erin9@illinois.edu
OFFICE HOURS:	1:00 – 1:50 pm on Wednesdays and by appointment, TBH 227

COURSE OVERVIEW

This course provides foundational **methods of urban planning analysis** that planners use to study cities and regions. It equips you with the knowledge and skills to describe and analyze a region's demographic, social and economic conditions, using quantitative data assembled from secondary sources. The first half of the course will cover the basic tools of inferential statistics and an introduction to R coding, while the second half will focus on applying these tools to study a specific region.

By the end of the course, you will gain hands-on experience in the following areas:
- **Reasoning and writing with numbers**
- **Data visualization** using effective tables, charts, and maps
- Foundational **inferential statistics**, including **regression analysis**
- **Key data sources** for understanding urban and regional demographic and economic changes
- Tools for analyzing **demographic change and economic structure** of cities and regions
- Basic approaches to **projecting future trends**
- **Intraurban data analytics**
- Developing a working familiarity with **R coding for data analytics**

TEXTBOOKS

1) Rea, Louis M. and Richard A. Parker. 2014. *Designing and Conducting Survey Research: A Comprehensive Guide, 4th edition*. San Francisco, CA: Josey-Bass Inc. E-book available via UIUC Library: https://rb.gy/qa4elk * U of I is not included in the institution list; Select "Institution not listed?", and then enter your university email.

2) Klosterman, Richard E., et al. 2018. Planning Support Methods: Urban and Regional Analysis and Projection. Lanham, MD: Rowman & Littlefield. Reserved at the Funk ACES Library.

* Additional readings will be posted on Canvas. Canvas.illinois.edu

COURSE AT A GLANCE — Assignment

			Assignment
1	Aug 26	Course overview	
	Aug 28	MS-Excel bootcamp	
2	Sep 2	Labor Day, No class	
	Sep 4	R bootcamp 1—Introduction	
3	Sep 9	Reasoning and writing with numbers	
	Sep 11	R bootcamp 2—Data wrangling	
4	Sep 16	Descriptive statistics and probability distribution	
	Sep 18	Data visualization with R	

5	Sep 23	Tests of differences	
	Sep 25	Tests of differences with R	
6	Sep 30	Regression analysis	
	Oct 2	Regression analysis with R	Research plan for Paper 1
7	Oct 7	Demographic data and Census geography	
	Oct 9	Census and ACS data analysis and mapping with R	
8	Oct 14	Defining regions	**Paper 1**-Regression analysis research
	Oct 16	Mapping journey to work	
9	Oct 21	Demographic analysis	
	Oct 23	Population pyramid, etc.	Study area selection
10	Oct 28	Population projection 1	
	Oct 30	Trend extrapolation	
11	Nov 4	Population projection 2	
	Nov 6	Cohort-component methods, ACSP Conference	
12	Nov 11	Regional economic structure and growth	
	Nov 13	Location quotient (LQ) and Swifty-Shifty	
13	Nov 18	Urban spatial structure	Interim report-Demographic & economic analysis
	Nov 20	Urban density analysis	
14	Nov 25	Fall Break	
	Nov 27	Fall Break	
15	Dec 2	Housing affordability in cities	
	Dec 4	Housing affordability analysis	
16	Dec 9	Transportation accessibility in cities	
	Dec 11	Transit access analysis	
		Paper 2-regional analysis due on Dec 16, Monday by NOON	

COURSE SET-UP

This course is designed in the spirit of "**learning by doing**." You will gain hands-on experience through lab sessions, weekly assignments, and two term papers.

Mondays will typically feature **lectures**, while Wednesday will generally be dedicated to **labs**. Completing the assigned **readings** (or online modules, depending on the week) before class is important. While I won't quiz you on the material during class, your understanding will be evident in your assignments.

Data skills are essential for professional success but are not sufficient on their own. Mastering R or other technical tools is valuable, but it won't take you far if you lack knowledge in areas like land use, transportation, housing, and economic development, or communication skills. Conversely, dismissing technical skills as distractions from the "real work" of planning will also limit your progress. Remember that you won't have much of an audience if you cannot obtain, analyze, and present data effectively.

EVALUATION

Class Participation/Attendance	10 %
Weekly lab assignments	30 %
Term paper 1 – Regression analysis research	20 %
Term paper 2 – Regional analysis report	40 %

COURSE REQUIREMENTS

Weekly lab assignments: After each Wednesday lab session, small weekly assignments will be given. These assignments are typically due by 9:30 am the following Monday unless noted otherwise.

Term paper 1: Regression analysis research:
For this assignment, you will conduct a brief study on a chosen urban or regional issue using multiple regression analysis. Begin by identifying an urban issue or planning problem that interests you and developing testable research questions. Next, identify key variables and available data, specify your regression model, and conduct the analysis. Your findings and their implications should be presented in a 5 to 6-page paper. Detailed guidelines will be provided.

Term paper 2: Regional analysis report:
You will conduct a comprehensive study to report on the existing conditions of a selected region. Choose a region that interests you, and analyze its demographic characteristics, socio-economic conditions, and economic base using the analytical tools learned in this course. Based on your analysis, you will write a report that synthesizes your findings. Detailed guidelines will be provided.

In general, homework assignments are due at 9:30am on the due date unless noted otherwise. Late lab/homework assignments will be graded down by 20% per day up to 50%.

POLICIES

SPECIAL ACCOMMODATIONS	This course will accommodate students with documented disabilities. Please refer to https://www.disability.illinois.edu/ for more information and provide the appropriate documentation in the beginning of the semester.
ACADEMIC INTEGRITY	This course follows the guidelines set forth by the University student code. **Plagiarism** in this class is unacceptable. Any accidental or willful use of words, work, or ideas of another without appropriate quotation and citation will be penalized by a **failing grade** on the paper and/or a failing grade in the course. Please see the definition of plagiarism here: https://studentcode.illinois.edu/article1/part4/1-402/. Be reminded that all your submissions to the Canvas will go through plagiarism checking.
EMERGENCY RESPONSE RECOMMENDATIONS	The Department of Homeland Security and the University of Illinois at Urbana-Champaign Office of Campus Emergency Planning recommend the following three responses to any emergency on campus: **RUN > HIDE > FIGHT.** For more information, https://police.illinois.edu/em/run-hide-fight/
COUNSELING CENER	The Counseling Center is committed to providing a range of services intended to help students develop improved coping skills in order to address emotional, interpersonal, and academic concerns. The Counseling Center provides individual, couples, and group counseling. All of these services are paid for through the health services fee. The Counseling Center offers primarily short term counseling, but they do also provide referrals to the community when students could benefit from longer term services. https://counselingcenter.illinois.edu/
USE OF GENERATIVE AI TECHNOLOGY	The use of Generative AI tools, including ChatGPT and Gemini, is **permitted** for these limited activities:

- Brainstorming and refining your ideas
- Finding information on your topic
- Checking grammar and style

Activities for which the use of generative AI is **not permitted** include:
- Writing a draft of a writing assignment
- Writing entire sentences, paragraphs or papers to complete class assignments
- Generating tables and figures to include in class assignments

You are responsible for the information you submit based on an AI query (for instance, that it does not violate intellectual property laws, or contain misinformation or unethical content). Your use of AI tools must be **properly documented and cited** in order to stay within university policies on academic honesty mentioned above. Any use outside of this permission will be considered academic dishonesty.

ATTENDANCE POLICY

Regular attendance at all scheduled classes (lectures and labs) is crucial for success in the course. If you must miss class for a religious observance or an approved reason, you need to contact the instructor at least one week prior to the absence and provide a proper absence documentation (e.g. Request for Accommodation for Religious Observances). In case of serious illness or family emergencies, inform the instructor via email as soon as possible.

COURSE SCHEDULE with reading assignments   * Optional reading

Week 1

Aug 26 Course overview

Aug 28 MS-Excel bootcamp

Excel Statistics Essential Training: 1 An introductory Excel course in Linkedin Learning (you can access with U of I email). Go through Introduction and 1. Excel Statistics Fundamentals, prior to class. https://rb.gy/tva3cq

Week 2

Sep 2 Labor Day, No class

Sep 4 R & R Studio bootcamp 1—Introduction

R for Data Science: An introductory course in Linkedin Learning. Go through the first two modules—1. What is R? and 2. Getting Started. https://rb.gy/iwp110

Week 3

Sep 9 Reasoning and writing with numbers

Klosterman et al. (2018) 9. Using planning support methods, pp. 237-251.

Sep 11 R & R Studio bootcamp 2—Data wrangling

[R for Data Science](https://rb.gy/iwp110): 4. Data Wrangling. https://rb.gy/iwp110

WEEK 4

Sep 16 Descriptive statistics and probability distribution

Rea & Parker (2014) pp. 99-145.

Sep 18 Data visualization with R

[R for Data Science](https://rb.gy/iwp110): 3. Data Visualization. https://rb.gy/iwp110

WEEK 5

Sep 23 Tests of differences

Rea & Parker (2014) pp. 203-260.

Sep 25 Descriptive stats and tables

[R for Data Science](https://rb.gy/iwp110): 5. Data Analysis—frequencies, descriptives, and contingency tables. https://rb.gy/iwp110

WEEK 6

Sep 30 Regression analysis

Rea & Parker (2014) pp. 261-291.

Oct 2 Regression analysis with R

[R for Data Science](https://rb.gy/iwp110): 5. Data Analysis—correlations and linear regression. https://rb.gy/iwp110

Glaeser, E. L., & Shapiro, J. M. (2003). Urban growth in the 1990s: Is city living back?. *Journal of regional science*, *43*(1), 139-165. The "county" worksheet includes the data while the "dictionary" worksheet provides variable descriptions

Week 7

Oct 7 Demographic data and Census geography

Klosterman et al. (2018) 2. Welcome to Decatur, pp. 13-34.

Oct 9 Census and ACS data analysis, and mapping with R

Week 8

Oct 14 Defining regions

OMB. 2021. 2020 Standards for delineating CBSA. Federal Register, 86 (134).

OMB. 2022. Urban Area Criteria for the 2020 Census—Final Criteria. Federal Register 87 (57).

Oct 16 Mapping journey to work

Week 9

Oct 21 Demographic analysis

Klosterman et al. (2018) 2. Welcome to Decatur, pp. 13-34

Oct 23 Population pyramid, etc.

Week 10

Oct 28 Population projection 1

Klosterman et al. (2018) 1.1. Planning and the Future, pp. 1-5 and 3. Trend Projection Methods, pp. 35-60.

Oct 30 Trend projection—Extrapolation

Week 11

Nov 4 Population projection 2

Klosterman et al. (2018) 5. Cohort-Component Methods, pp. 79-124

Nov 6 Cohort-Component Methods, ACSP Conference

Week 12

Nov 11 Regional economic structure and growth

Klosterman et al. (2018) 6. Economic Analysis Methods, pp. 125-164.

Nov 13 Location quotient (LQ) and Swifty-Shifty

Week 13

Nov 18 Urban spatial structure

O'Sullivan (2019) 13. Spatial distribution of employment and residence, 14. The monocentric city and urban general equilibrium, pp. 199-223.

Nov 20 Urban density analysis

Week 14

Fall Break

Week 15

Dec 2 Housing affordability in cities

https://www.planning.org/planning/2023/winter/what-is-zoning-reform-and-why-do-we-need-it/

https://www.planning.org/blog/9252339/housing-scarcity-is-worse-than-ever/

ECWRPC. 2018. Regional housing affordability summary report.—no need to read line-by-line; scan the structure of the report.

Dec 4 Housing affordability analysis

https://storymaps.arcgis.com/stories/a4f5a12fd8e34112a770b3d836eeef5e

Week 16

Dec 9 Transportation accessibility in cities

Dec 11 Transit access analysis

Final Paper due on Dec 16 Monday by NOON