UP 316
Urban Informatics II

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

LECTURES:	Monday and Wednesday, 11:00 – 11:50am, TBH 225
LABS:	Friday, 11:00–11:50am, 101 Oregon Building Computer Lab (901 W Oregon St)
INSTRUCTOR:	Bumsoo Lee, M206 TBH, bumsoo@illinois.edu Office hours: 10:00-10:50am on Wednesday and by appointment, TBH M206
TEACHING ASSISTANT:	Rose Ravi Krishnan, roserav2@illinois.edu **Office hours: 12:00-12:50pm on Friday and by appointment, Oregon Lab**
HOURS:	3 credit hours; 3 contact hours (3 days/week for 50 minutes each)

COURSE OVERVIEW

Urban planning hinges on understanding current and future urban conditions. UP 316 is your gateway to **data analysis skills** that empower planners and researchers to collect, analyze, and interpret critical urban data for various planning projects.

The first half dives deep into **sample survey research**, the cornerstone of data collection. You will master designing and administering effective surveys and analyzing and interpreting results. You will also have a hands-on experience of conducting your own group survey project.

The second half expands your toolkit with advanced techniques planners use to decipher a city's **demographics**, **socioeconomics**, and **future trajectory**.

Course highlights:

- **Survey research**: Craft questionnaires, administer surveys, analyze data, and write reports like a pro
- **Statistical analysis**: Uncover the power of statistical tools for dissecting survey data
- **Demographic deep dives**: Learn to analyze demographics and project future population
- **Regional economic analysis**: Grasp economic base models and shift-share analysis
- **Cost-benefit ace**: Master cost-benefit analysis for project evaluation
- **Tech Toolbox**: Leverage MS-Excel and R for urban data crunching

Mondays and Wednesdays bring interactive lectures and discussions, where you will delve into foundational concepts, theories, and tools in urban informatics. Fridays are lab days, where you will apply these tools to real-world data using computer programs. The best way to learn urban data analytics is ***learning by doing***. So, expect various exercises and assignments throughout the semester.

Come prepared to class, actively engage in discussions, and stay ahead with the required readings. All **lecture notes** will be uploaded to Canvas (canvas.illinois.edu) to free you from note-taking and maximize your in-class participation.

PREREQUISITE

UP 116 Urban Informatics I or an equivalent introductory statistics course.

COURSE AT A GLANCE

Week	Dates	Topic	Assignment
1	Jan 17	Introduction to UP316	
2	Jan 22, 24	Overview of survey process; Survey design	
3	Jan 29, 31	Survey design & administration	Survey-5 Likert scale questions (2/1)
4	Feb 5, 7	Statistical tools—Descriptive statistics; Confidence intervals	Survey-survey draft (2/9)
5	Feb 12, 14	Statistical tools—Difference in means test	Survey-pre-test report (2/16)
6	Feb 19, 21	Statistical tools—Correlation and regression	
7	Feb 26, 28	Survey sampling	Survey-completed survey data (3/1)
8	Mar 4, 6	Census geography	**EXAM**
	Mar 11, 13	Spring break	
9	Mar 18, 20	Demographic analysis & Population projection	Survey-**Final report (3/22)**
10	Mar 25, 27	Population projection	
11	Apr 1, 3	Population projection	
12	Apr 8, 10	Regional economic analysis	Assignment 1 (4/12)
13	Apr 15, 17	Regional economic analysis	
14	Apr 22, 24	Regional economic analysis; Cost-benefit analysis	Assignment 2 (4/26)
15	Apr 29, May1	Cost-benefit analysis	Assignment 3 (5/6)

LAB & LAB ASSIGNMENT AT A GLANCE

Week	Dates	Lab Topic	Lab Assignment
1	Jan 19	MS-Excel 101	Lab assignment 1
2	Jan 26	Introduction to R & R-Studio	Lab assignment 2
3	Feb 2	Survey project team building and discussion	
4	Feb 9	Data analysis with R—Descriptive statistics	Lab assignment 3
5	Feb 16	Data analysis with R—Cross-tab, t-test, ANOVA	Lab assignment 4
6	Feb 23	Data analysis with R—Correlation & Regression	Lab assignment 5
7	Mar 1	Group work—Survey data analysis	
8	Mar 8	Data visualization with Excel and R	Lab assignment 6
	Mar 15	Spring break	
9	Mar 22	Downloading census data & population pyramid	Lab assignment 7
10	Mar 29	Trend extrapolation method exercise	Lab assignment 8
11	Apr 5	Cohort component method exercise	Lab assignment 9
12	Apr 12	Economic base analysis exercise	Lab assignment 10
13	Apr 19	Shift-share analysis exercise	Lab assignment 11
14	Apr 26	Cost-benefit analysis (CBA) exercise	
15		No lab	

TEXTBOOKS

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 at UIUC Library https://learning.oreilly.com/library/view/designing-and-conducting/9781118767023/?ar=
* U of I is not included in the institution list; Select “Institution not listed?”, and then enter your university email.

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 reading assignments (or the links to them) will be uploaded to Canvas.

REQUIREMENTS

You will be required to complete one group survey project, one exam and a series of homework/lab assignments. Class participation grade will be based on both random attendance checks and class participation. Each unexcused absence will reduce your final grade by 1%.

GRADES will be assigned as follows:

Group Project: Student Attitude Survey	20 %
Mid-term EXAM	20 %
Lab Assignments	20 %
Homework Assignments	30 %
Participation/Attendance	12 %

ASSIGNMENTS and PROJECTS: In general, homework assignments are due at 11am on the due date unless noted otherwise. Lab assignments are generally due by 11am on the following Monday, but students will be able to complete most lab assignments during the lab on the same day. Late lab/homework assignments will be graded down by 20% per day up to 50%.

RUBRIC: The general grading rubric for assignments and projects is as follows:

A: Demonstrates original thought and synthesis of ideas and cogent analysis, and is clearly written and presented. Outstanding work.
B: Presents above average analysis with appropriate evidence to support ideas, and is clearly written or presented. Good work.
C: Shows a basic level of understanding, with analysis limited to obvious arguments. Writing is competent. Adequate work.
D: Misunderstands or misrepresents the material, or is so poorly written or presented as to obscure the analysis. Inadequate work.

Transformation of numerical grade to letter grade will be according to the schedule below:

A+	97-100		
A	93-96.9	C+	77-79.9
A-	90-92.9	C	73-76.9
B+	87-89.9	C-	70-72.9
B	83-86.9	D+	67-69.9
B-	80-82.9	D	60-66.9

POLICIES

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 to discuss arrangements 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 and TA via email as soon as possible.

SPECIAL ACCOMMODATIONS This course will accommodate students with documented disabilities. Please refer to https://www.disability.illinois.edu/academic-accommodations-and-

supports/academic-accommodations for more information and provide the appropriate documentation at the beginning of the semester.

ACADEMIC INTEGRITY

This course follows the guidelines set forth by the University student code. See https://studentcode.illinois.edu/article1/part4/1-401/ for specific guidelines, examples, and punishment associated with academic dishonesty.

PLAGIARISM

Plagiarism in this class is unacceptable. Any accidental or willful use of words, work, or ideas of another without attribution (e.g. 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.

USE OF GENERATIVE AI TECHNOLOGY

The use of Generative AI tools, including ChatGPT and Bard, is **permitted** for these limited activities:
- Brainstorming and refining your ideas
- Finding information on your topic
- Identifying r coding examples
- 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
- Completing group work that your group has assigned to you
- 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.

CLASS CLIMATE

The Department of Urban and Regional Planning (DURP) is committed to creating an environment of inclusion and opportunity that is rooted in the very goals and responsibilities of practicing planners. Conduct that interferes with the rights of another or creates an atmosphere of intimidation or disrespect is inconsistent with the environment of learning and cooperation that the program requires. By enrolling in a course in the Department of Urban and Regional Planning, students agree to be responsible for maintaining a respectful environment in all DURP activities, including lectures, discussions, labs, projects, and extracurricular programs. We will be governed by the University Student Code. See Student Code Article 1—Student Rights and Responsibilities, Part 1. Student Rights: §1-102 In the Classroom.

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/

READING ASSIGNMENTS	Rea and Parker = Rea, Louis M. and Richard A. Parker.2014.*Designing and Conducting Survey Research: A Comprehensive Guide*, 4th edition. Klosterman et al. = Klosterman, Richard, et al. 2018. *Planning Support Methods: Urban and Regional Analysis and Projection*. Lanham, MD: Rowman & Littlefield.

INTRODUCTION

Week 1	1/17	Introduction to UP316; Rea and Parker, Chapter 1: *An Overview of the Sample Survey Process*
Lab:	1/19	MS-Excel 101

DEVELOPING AND ADMINISTERING SURVEY

Week 2	1/22	Rea and Parker, Chapter 1: *An Overview of the Sample Survey Process*
(Project 1 handout)	1/24	Rea and Parker, Chapter 2: *Designing Effective Questionnaires: Basic Guidelines*
Lab:	1/26	Introduction to R and R-Studio: Overview, data import & export
Week 3	1/29	Rea and Parker, Chapter 3: *Developing Survey Questions*
	1/31	Administering efficient surveys (Rea and Parker, Chapters 1 - 3)
Lab:	2/2	**Must attend**! Survey team building and team discussion on the survey topic and design
Assignment:	2/1	Five Likert scale questions (submit a pdf file to Canvas by Thursday **midnight** AND bring a hard copy to the Friday lab session)

ANALYSING SURVEY RESULTS

Week 4	2/5	Rea and Parker, Chapter 5: *Descriptive Statistics: Measures of Central tendency and Dispersion* and Chapter 6: *The Theoretical Basis of Sampling*
	2/7	Rea and Parker, Chapter 7: *Confidence Intervals and Basic Hypothesis Testing*
Lab:	2/9	Data analysis with R: Descriptive statistics, confidence intervals
Assignment:	2/9	Group survey *draft* due
Week 5	2/12	Rea and Parker, Chapter 10: *Analyzing Cross-Tabulated Data*
	2/14	Rea and Parker, Chapter 11: *Testing the Difference Between Means*
Lab:	2/16	Data Analysis with R: Cross-Tab, t-test, and ANOVA
Assignment:	2/16	Finalized survey & pre-test report due
Week 6	2/19	Rea and Parker, Chapter 12: *Regression and Correlation*
	2/21	Rea and Parker, Chapter 12: *Regression and Correlation, Continued*
Lab:	2/23	Data Entry (Coding) and Data Analysis with R: Correlation & Regression

SURVEY SAMPLING

Week 7	2/26	Rea and Parker, Chapter 8: *Determining Sample Size*
	2/28	Rea and Parker, Chapter 9: *Selecting a Representative Sample*
Lab:	3/1	Group work—Survey data analysis
Assignment:	3/1	Bring completed survey for data coding and analysis

MID-TERM EXAM

Week 8	3/4	**EXAM**

CENSUS GEOGRAPHY AND CENSUS DATA

	3/6	OMB (2021) 2020 Standards for delineating Core Based Statistical Areas: Notice. *Federal Register* 86 (134) https://www.federalregister.gov/documents/2021/07/16/2021-15159/2020-standards-for-delineating-core-based-statistical-areas
Lab	3/8	Data Visualization: Graphs and Charts with Excel and R

DEMOGRAPHIC ANALYSIS AND POPULATION PROJECTION

Week 9	3/18	Klosterman et al. Chapter 1 Foundations (pp. 1-10); Chapter 2 Welcome to Decatur (pp. 13-33)
	3/20	Klosterman et al. Chapter 3 Trend Projection Methods (pp. 35-48)
Lab	3/22	Downloading Census Data & Population Pyramid
Assignment:	3/22	Group Survey Research Final Report Due
Week 10	3/25	Klosterman et al. Chapter 3 Trend Projection Methods (pp. 35-48)
	3/27	Klosterman et al. Chapter 5 Cohort-Component Methods (pp. 79-117)
Lab:	3/29	Trend Extrapolation Exercise
Week 11	4/1	Klosterman et al. Chapter 5 Cohort-Component Methods (pp. 79-117)
	4/3	Klosterman et al. Chapter 5 Cohort-Component Methods (pp. 79-117)
Lab:	4/5	Cohort Component Method Exercise

REGIONAL ECONOMIC ANALYSIS

Week 12	4/8	Klosterman et al. Chapter 6 Economic Analysis Methods (pp. 125-159)
	4/10	Klosterman et al. Chapter 6 Economic Analysis Methods (pp. 125-159)
Lab:	4/12	Economic Base Analysis Exercise
Assignment:	4/12	Assignment 1 due: Population Analysis and Projection
Week 13	4/15	Klosterman et al. Chapter 6 Economic Analysis Methods (pp. 125-159)
	4/17	Klosterman et al. Chapter 6 Economic Analysis Methods (pp. 125-159)
Lab:	4/19	Shift-Share Analysis Exercise
Week 14	4/22	Klosterman et al. Chapter 6 Economic Analysis Methods (pp. 125-159)

PROJECT EVALUATION: COST BENEFIT ANALYSIS

	4/24	Gupta, Dipak K. 2001. Chapter 14: Choosing the Best Alternative: Cost-Benefit Analysis from *Analyzing Public Policy: Concepts, Tools and Techniques.*

Lab:	4/26	Cost Benefit Analysis Exercise
Assignment:	4/26	Assignment 2: Regional Economic Analysis
Week 15	4/29	*Cost-Benefit analysis*, Continued.
	5/1	*Cost-Benefit analysis*, Continued.
Assignment:	5/6	Assignment 3: Cost Benefit Analysis of an LRT project due by **Noon**.