

UP 316 Urban Informatics II

Department of Urban and Regional Planning
University of Illinois at Urbana-Champaign
Spring 2021

LECTURES:	Monday and Wednesday, 2:00 – 2:50pm, Zoom
LABS:	Friday, 2:00– 2:50pm, Zoom
INSTRUCTOR:	Bumsoo Lee, M206 Temple Buell Hall, bumsoo@illinois.edu Office hours: 1:00pm-1:50pm on Monday and by appointment, Zoom
TEACHING ASSISTANT:	Arpita Banerjee, arpitab2@illinois.edu Office hours: 3:00pm-3:50pm on Friday and by appointment, Zoom

COURSE OVERVIEW

Any successful planning process requires *information* on the current and future conditions of the community and region. UP 316 is designed to teach formal planning methods that help planners collect and analyze critical information and data for various urban planning projects. The first half of the semester will focus on a primary data collection method, survey research. Students will learn how to design and administer an effective sample survey and how to analyze and interpret survey results. Students will also have a hands-on experience of conducting their own sample survey research as a group project. The second half of the course will focus on other quantitative analytical techniques that are widely used by planners to understand demographic and socio-economic conditions of a city and its future.

Among the topics to be covered are:

- Survey research – questionnaire design, administering survey, data analysis & report writing
- Review of statistical tools and their application to survey data analysis
- Demographic analysis and population projection methods
- Economic analysis techniques: economic base model and shift-share analysis
- Cost-benefit analysis as a project evaluation method
- Using MS-Excel and R for urban data analysis

Monday and Wednesday classes are in a lecture/discussion format. Students will learn and discuss foundational concepts, theories, and tools in urban informatics. In Lab sessions on Friday, students will have opportunities to apply these tools using real world data and computer programs. The best way to learn planning methods is *learning by doing*. Thus, various exercises and assignments will be given throughout the semester.

Students should read required readings, be prepared for class, and actively participate in class discussions. All the lecture notes will be posted on the Compass course webpage (<https://compass2g.illinois.edu>) so that students can reduce the need for note taking and more actively participate in class discussion.

PREREQUISITE

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

COURSE AT A GLANCE

Week	Dates	Topic	Assignment Due
1	Jan 25, 27	Introduction; Overview of survey process	
2	Feb 1, 3	Survey design	Survey-5 questions (2/4)
3	Feb 8, 10	Survey administration; Descriptive statistics	
4	Feb 15	Statistical tools—Confidence intervals	Survey-survey draft (2/15)
5	Feb 22, 24	Statistical tools—Difference in means test	Survey-pre-test report (2/26)
6	Mar 1, 3	Statistical tools—Correlation and regression	
7	Mar 8, 10	Survey sampling	Survey-completed survey data (3/12)
8	Mar 15, 17	EXAM; Definition of cities	
9	Mar 22	Demographic analysis	Survey-final report (3/26)
10	Mar 29, 31	Population projection—Trend extrapolation	
11	Apr 5, 7	Population projection—Cohort-component	
12	Apr 12, 14	Regional economic analysis	Assignment 1 (4/16)
13	Apr 19, 21	Regional economic analysis	
14	Apr 26, 28	Cost-Benefit Analysis	Assignment 2 (4/30)
15	May 3, 5	Cost-Benefit Analysis, Continued	Assignment 3 (5/10)

LAB & LAB ASSIGNMENT AT A GLANCE

Week	Dates	Lab Topic	Lab Assignment
1	Jan 29	Excel 101	Lab assignment 1
2	Feb 5	Survey project team building and discussion	
3	Feb 12	Introduction to R & R-Studio	Lab assignment 2
4	Feb 19	Data analysis with R—Descriptive statistics	Lab assignment 3
5	Feb 26	Data analysis with R—Cross-tab, t-test, ANOVA	Lab assignment 4
6	Mar 5	Data analysis with R—Correlation & Regression	Lab assignment 5
7	Mar 12	Group work—Survey data analysis	
8	Mar 19	Data visualization with Excel and R	Lab assignment 6
9	Mar 26	Downloading census data & population pyramid	Lab assignment 7
10	April 2	Trend extrapolation method exercise	Lab assignment 8
11	Apr 9	Cohort component method exercise	Lab assignment 9
12	Apr 16	Economic base analysis exercise	Lab assignment 10
13	Apr 23	Shift-share analysis exercise	Lab assignment 11
14	Apr 30	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://vufind.carli.illinois.edu/vf-uiu/Record/uiu_8498416.

Wang, Xinhao and Rainer vomHofe. 2007. *Research Methods in Urban and Regional Planning*. Berlin, Germany: Springer. E-book link: <https://link.springer.com/book/10.1007%2F978-3-540-49658-8>.

Additional reading assignments or the links to them will be posted on the Compass.

REQUIREMENTS

Students 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. Poor attendance will not result in automatic failure, but 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 2pm (class time) on the due date unless noted otherwise. Lab assignments are generally due by 11:59pm on the same day (Friday) unless noted otherwise. Late lab/homework assignments will be graded down by 10% per day up to 20%. Detailed guides for projects/assignments will be handed out later.

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

SPECIAL ACCOMMODATIONS

This course will accommodate students with documented disabilities. Please refer to <http://www.disability.uiuc.edu/resourceguide> 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 http://www.admin.uiuc.edu/policy/code/article_1/a1_1-401.html for specific guidelines, examples, and punishment associated with 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, <http://police.illinois.edu/emergencyplanning/general/> More detailed recommendations for emergency response and TBH floor plans are posted on the Compass website of the course.

COUNSELING CENTER

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. San Francisco, CA: Josey-Bass Inc. E-book available at UIUC Library https://vufind.carli.illinois.edu/vf-uiu/Record/uiu_8498416

Wang and vomHofe =

INTRODUCTION AND OVERVIEW

Week 1

- 1/25 Introduction to UP316; Rea and Parker, Chapter 1: *An Overview of the Sample Survey Process*
1/27 Rea and Parker, Chapter 1: *An Overview of the Sample Survey Process*

Lab: 1/29 Excel 101

DEVELOPING AND ADMINISTERING SURVEY

Week 2

- (Project 1 hand out) 2/1 Rea and Parker, Chapter 3: *Developing Survey Questions*
2/3 Rea and Parker, Chapter 2: *Designing Effective Questionnaires: Basic Guidelines*

Lab: 2/5 **Must attend!** Survey project team building and group discussion on survey topic and individually developed survey questions

Assignment: 2/4 Five survey questions due (Post a pdf file to the Compass by **midnight** on 2/4

AND bring a hard copy to the Friday lab session)

Week 3

Readings:	2/8	Administering efficient surveys (Rea and Parker, Chapters 1 - 3)
	2/10	Rea and Parker, Chapter 5: <i>Descriptive Statistics: Measures of Central tendency and Dispersion</i> and Chapter 6: <i>The Theoretical Basis of Sampling</i>
Lab:	2/12	Introduction to R and R-Studio: Overview, data import & export

ANALYSING SURVEY RESULTS**Week 4**

Readings:	2/15	Rea and Parker, Chapter 7: <i>Confidence Intervals and Basic Hypothesis Testing</i>
Assignment:	2/15	Group survey <i>draft</i> due
	2/17	No class day
Lab:	2/19	Data analysis with R: Descriptive statistics, confidence intervals & cross-tab

Week 5

Readings:	2/22	Rea and Parker, Chapter 10: <i>Analyzing Cross-Tabulated Data</i>
	2/24	Rea and Parker, Chapter 11: <i>Testing the Difference Between Means</i>
Lab:	2/26	Data Analysis with R: Cross-Tab, t-test, and ANOVA
Assignment:	2/26	Finalized survey & pre-test report due

Week 6

Readings:	3/1	Rea and Parker, Chapter 12: <i>Regression and Correlation</i>
	3/3	Rea and Parker, Chapter 12: <i>Regression and Correlation, Continued</i>
Lab:	3/5	Data Entry (Coding) and Data Analysis with R: Correlation & Regression

SURVEY SAMPLING**Week 7**

Readings:	3/8	Rea and Parker, Chapter 8: <i>Determining Sample Size</i>
	3/10	Rea and Parker, Chapter 9: <i>Selecting a Representative Sample</i>
Lab:	3/12	Group work—Survey data analysis
Assignment:	3/12	Bring completed surveys to the lab session for data coding

MID-TERM EXAM

Week 8	3/15	EXAM
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CENSUS GEOGRAPHY AND CENSUS DATA

Readings:	3/17	OMB (2010) 2010 Standards for delineating metropolitan and micropolitan statistical areas: Notice. <i>Federal Register</i> 75 (123) https://www.govinfo.gov/content/pkg/FR-2010-06-28/pdf/2010-15605.pdf U.S. Census. 2013. 2010 Census Data Product Descriptions. Washington, DC: U.S. Census Bureau. Available at http://www.census.gov/2010census/news/pdf/data_products_2010_census2.pdf ;
Lab	3/19	Data Visualization: Graphs and Charts with Excel and R

DEMOGRAPHIC ANALYSIS AND POPULATION PROJECTION**Week 9**

Readings: 3/22 Wang and vomHofe, Chapter 3 Demographic Analysis (pp. 53-80); Hoch, Dalton, and So, 2000, *The Practice of Local Government Planning*, Chapter 4 Population Analysis.
 3/24 **No class day**

Lab 3/26 Downloading Census Data & Population Pyramid
Assignment: 3/26 Project 1: Group Survey Research Final Report Due

Week 10

Readings: 3/29 Wang and vomHofe, Chapter 3 Demographic Analysis (pp. 65-109). And Chapter 3 Demographic Analysis, Trend Extrapolation Methods (pp. 81-109).
 3/31 Wang and vomHofe, Chapter 3 Demographic Analysis, Trend Extrapolation Methods (pp. 81-109).

Lab: 4/2 Trend Extrapolation Exercise

Week 11

Readings: 4/5 Wang and vomHofe, Chapter 3 Demographic Analysis, Cohort-Component Method (pp. 110-127).

REGIONAL ECONOMIC ANALYSIS

4/7 Wang and vomHofe, Chapter 3 Demographic Analysis, Cohort-Component Method (pp. 110-127), *Continued*.

Lab: 4/9 Cohort Component Method Exercise

Week 12

Readings: 4/12 Wang and vomHofe, Chapter 4 Understanding Your Regional Economy (pp. 134-164).
 4/14 Wang and vomHofe, Chapter 4 Understanding Your Regional Economy (pp. 134-164 and pp. 196-201)

Lab: 4/16 Economic Base Analysis Exercise
Assignment: 4/16 Assignment 1 due: Population Analysis and Projection

Week 13

Readings: 4/19 Wang and vomHofe, Chapter 4 Understanding Your Regional Economy (pp. 165-194)
 4/21 Wang and vomHofe, Chapter 4 Understanding Your Regional Economy (pp. 202-212); Richard Klosterman, Chapter 12 Constant-Share and Shift-Share Approaches

Lab: 4/23 Shift-Share Analysis Exercise

PROJECT EVALUATION: COST BENEFIT ANALYSIS**Week 14**

Readings: 4/26 Gupta, Dipak K. 2001. Chapter 14: Choosing the Best Alternative: Cost-Benefit Analysis from *Analyzing Public Policy: Concepts, Tools and Techniques*.

4/28 *Cost-Benefit analysis, Continued.*

Lab: 4/30 Cost Benefit Analysis Exercise

Assignment: 4/30 Assignment 2 due: Regional Economic Analysis

Week 15

Readings: 5/3 *Cost-Benefit analysis, Continued.*

5/5 *Cost-Benefit analysis, Continued.*

Assignment: 5/10 Assignment 3 due: Cost Benefit Analysis due by **Noon.**

No class days: Feb 17, Mar 24, & Apr 13.