Research Methods
URSP 601
Wednesdays 7:00 – 9:40
ARC 1115
Professor Casey Dawkins

Instructor Contact Information

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Course Description

Quantitative analysis is the craft of "painting with numbers." The researcher is an artist that applies technique, intuition, and creativity toward the investigation of a particular research question. Effective researchers learn to be explorers, designers, analysts, and communicators, often assuming all four of these roles within the span of a single research project. Researchers must also learn to be inventors. When the researcher's toolbox of techniques becomes outdated or is not well-suited to address a particular research question, the researcher must create new tools or techniques and learn how to modify these new tools to meet the demands of a changing research environment.

The purpose of this course is to introduce students to the art and science of quantitative data analysis as it is practiced in the urban and regional planning profession. Although "planning methods" consist primarily of standard statistical analysis techniques, the analytic tools employed by planners are unique in several respects:

1. Planning methods are employed to understand and craft solutions to policy problems. This has important implications, including the following:
    a. Most research conducted for planning and policy analysis is conducted in a short period of time with limited resources. Since research results are usually needed *yesterday*, analysts often rely on *back-of-the-envelope* calculations and quick methods of analysis.
    b. The research questions addressed by planners and policy analysts are value-laden, which suggests that researchers must not only *analyze* the different solutions to a particular research problem, but they must also *criticize* and *evaluate* proposed solutions using normative criteria.
    c. The research questions and problems addressed by planners and policy analysts are often *wicked* or *messy* problems that are ill-defined and complex.
    d. Planners and policy analysts simultaneously serve many different clients with a range of (often competing) interests.
2. Given the inherently spatial nature of urban issues and problems, planners often work with techniques which are uniquely designed to quantify spatial relationships.
3. Given our interest in preparing for the future, planners must often make use of specialized techniques designed to predict likely future scenarios.

4. Most local planning offices make heavy use of three common software packages: ArcGIS, Microsoft Excel, and SPSS. As such, computer implementation of the techniques discussed in class makes frequent use of these packages.

Course Objectives

This course has the following objectives:

1. Introduce students to basic concepts in applied statistics.
2. Introduce students to common data sources used in planning and policy analysis.
3. Teach students to think logically about policy problems and to employ quantitative methods when appropriate.
4. Develop a working knowledge of ArcGIS, Excel, and SPSS software packages and learn elegant methods of computation in those environments.
5. Teach students to effectively communicate their research findings.
6. Provide an introduction to specialized methods used in planning and policy analysis, particularly those methods designed to describe spatial and temporal phenomena.

The course places heavy emphasis on "learning by doing." As such, students will learn to explore, describe, analyze, and interpret quantitative data through exercises that are designed to replicate the types of projects commonly encountered by professional planners.

Grading

Your grade in the class will be determined by your performance on a class project and homework assignments. The class project consists of three graded interim reports and a final presentation which synthesizes the results of the interim reports. Several homework assignments will also be assigned to test students' knowledge of the course concepts, with students' participation in three in-class computer labs treated as a fifth homework grade. The weighted distribution of grades for each of these assignments is as follows (Refer to the course outline for due dates):

Class Project:

- Interim Report 1 (20%)
- Interim Report 2 (20%)
- Interim Report 3 (20%)
- Final Presentation (15%)

Homework:

- Homework 1: Descriptive Statistics (5%)
- Homework 2: Hypothesis Testing I (5%)
- Homework 3: Hypothesis Testing II (5%)
- Homework 4: Interpreting Regression Output (5%)
- Homework 5: Computer Lab Participation (5%)

The grading scale will be based on a plus / minus system with each assignment receiving a grade between 1 and 100 that is weighted as above. Final letter grades will be based on the following scale:

97 – 100:	A+
94 – 96.9:	A
90 – 93.9:	A –
87 – 89.9:	B+
84 – 86.9:	B
80 – 83.9:	B –
77 – 79.9:	C+
74 – 76.9:	C
70 – 73.9:	C –
67 – 69.9:	D+
64 – 66.9:	D
60 – 63.9:	D –
< 60:	F

Course Policies

Policy on Late or Missed Assignments
All work must be submitted by the due date. It is extremely important that you stay current in this course. Once you fall behind, it is difficult to get caught up, due to the pace of the course and the cumulative nature of the material.

Attendance Policy
I realize that extenuating circumstances often preclude students from attending every class. If you are absent from class, you are still responsible for ensuring that all assignments are completed by the due date.

Special Needs of Students
If you need course adaptations or accommodations due to a disability, please consult Disability Support Services in 0126 Shoemaker Hall to make necessary arrangements. The rules for eligibility and the types of accommodations a student may request can be reviewed on the DSS web site at http://www.counseling.umd.edu/DSS/receiving_serv.html.

Basic Needs Security
If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live and believe this may affect your performance in this course, please visit http://go.umd.edu/basic-needs for information about resources the campus offers you and let me know if I can help in any way.

Religious Observances
The University System of Maryland policy provides that students should not be penalized because of observances of their religious beliefs. Students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the responsibility of the student to inform the instructor of any intended absences for religious observances in advance. Notice should be provided as soon as possible but no later than the end of the schedule adjustment period. Prior notification is especially important in connection with final exams, since failure to reschedule a final exam before the conclusion of the final examination period may result in loss of credits during the semester. The problem is especially likely to arise when final exams are scheduled on Saturdays.

Academic Integrity

The University of Maryland has a nationally-recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards in this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit
http://www.studenthonorcouncil.umd.edu/whatis.html.

Course Evaluations
Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University as well as to the tenure and promotion process. You will be informed when CourseEvalUM will be open for you to complete your evaluations. You can go directly to the website (www.courseevalum.umd.edu) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing the summary reports for thousands of courses online at Testudo.

Course Readings

Required:
> Kenneth J. Meier, Jeffrey L. Brudney, and John Bohte. 2014. *Applied Statistics for Public and Nonprofit Administration, 9th Edition*. Cengage Learning: Stamford, CT.

Other assigned course readings will be posted on the ELMS (Canvas) course page. Students are required to read all assigned readings *prior* to the class in which the readings are assigned. Remember to check ELMS frequently for assigned supplemental readings.

Software

Microsoft Excel, ArcGIS, and SPSS are the primary software packages used in this class. These programs are installed on the lab computers.

NOTE: The class assumes prior exposure to Microsoft Excel, and the Excel exercises will focus primarily on building more advanced data analysis skills. If you have not been exposed to Excel or your Excel skills are outdated, please refer to the introductory material provided to you in the URSP Bootcamp. If you feel that you need additional practice in Excel, please consult Professor Dawkins early in the semester.

ELMS

ELMS (Canvas) will be an important component of this course. ELMS is an online environment created for use by University of Maryland students and faculty, accessible at elms.umd.edu. Each course is assigned a separate page and is accessible only by the course instructor and the students enrolled in the course. This system provides a convenient way to post readings, announcements, and assignments. You are responsible for any announcement or assignment posted on ELMS, regardless of whether the announcement or assignment was discussed in class, so check ELMS often! All files and material for URSP 601 can be accessed from the "Files" tab on the left-hand side of the URSP 601 ELMS page.

Tentative Course Outline and Weekly Reading List

Readings followed by "**E**" can be accessed from the ELMS (Canvas) course page. Due dates for all assignments are in *italicized* text. It is <u>*important*</u> that assignments be submitted by the beginning of class when the assignments are due, because we will discuss the answers to the assignments in class on the due date.

Week 1: Wednesday, August 28	Course Introduction and Overview *Distribute Class Project and Interim Report 1*
Week 2: Wednesday, Sept. 4	Conceptualization, Measurement, Data Types and Sources Overview of the U.S. Census and ACS
Reading:	ACS Handbook (**E**) Meier, Brudney, and Bohte (2006), Ch. 2
Week 3: Wednesday, Sept. 11	GIS Lab
Week 4: Wednesday, Sept. 18	Descriptive Statistics *Distribute Homework 1*
Reading:	Meier, Brudney, and Bohte (2006), Ch. 4-6
Week 5: Wednesday, Sept. 25	Excel Lab *Homework 1 Due*
Week 6: Wednesday, Oct. 2	Probability, Sampling, and Estimation Introduction to Hypothesis Testing *Interim Report 1 Due* *Distribute Interim Report 2*
Reading:	Meier, Brudney, and Bohte (2006), Ch. 7,8, 10-12
Week 7: Wednesday, Oct. 9	Hypothesis Testing II, Introduction to SPSS *Distribute Homework 2*
Reading:	Meier, Brudney, and Bohte (2006), Ch. 13
Week 8: Wednesday, Oct. 16	SPSS Lab
Week 9: Wednesday, Oct. 23	NO CLASS: ACSP CONFERENCE *(Work on hypothesis testing example problems and Interim Report 2)*
Week 10: Wednesday, Oct. 30	Categorical Data Analysis / Measures of Association *Homework 2 Due* *Distribute Homework 3*
Reading:	Meier, Brudney, and Bohte (2006), Ch. 14,15
Week 11: Wednesday, Nov. 6	Multivariate Regression I *Homework 3 Due*

Distribute Interim Report 3
Interim Report 2 Due

Reading: Meier, Brudney, and Bohte (2006), Ch. 17,20,21

Week 12: Wednesday, Nov. 13   Multivariate Regression II
Distribute Homework 4

Reading: Meier, Brudney, and Bohte (2006), Ch. 18

Week 13: Wednesday, Nov. 20   Prediction, Forecasting, and Simulation
Homework 4 Due

Reading: Wang and Hofe (2007), Ch. 3 (**E**)
Meier, Brudney, and Bohte (2006), Ch. 19

Week 14: Wednesday, Nov. 27   NO CLASS: THANKSGIVING BREAK

Week 15: Wednesday, Dec. 4   Interim Report 3 Q&A

Week 16: Wednesday, Dec. 11   Course Wrap-Up
Class Project Presentations
Interim Report 3 Due