



PLAN 230: ADVANCED PLANNING METHODS Fall 2005

Lecture Sessions:	09:00AM-10:15AM (before 1-Nov)	Mon. & Wed.	New East, Room 305
	11:00AM-12:15 PM (after 1-Nov)	Tue. & Thu.	New East, Room 102
Computer Labs:	12:30 PM-01:45 PM	Thu.	New East, Computer Lab
Review Sessions:	11:00 AM-12:15 PM	Fri.	New East, Room 305



Instructor:

Professor Asad J. Khattak (khattak@email.unc.edu)

Teaching Assistants:

Xiaohong Pan (xiaohong@email.unc.edu)

DESCRIPTION

This course focuses on providing incoming planning students with the knowledge and skills to structure planning problems/issues, obtain and analyze data, and interpret and present the results. Specific topics include: Study design, measurement of variables, descriptive data analysis, mapping, inferential statistics and analysis of relationships using contingency tables and regression. The course will help students use computers for calculating and displaying statistics and analyzing data. Students will be familiarized with worksheet and data analysis software, in particular Excel, SPSS and ArcView. After taking the course students should be able to clearly analyze planning problems/issues using statistical methods. Moreover, they should be able to support planning decisions, draw logical conclusions from statistical analysis and critically review and evaluate technically oriented peer-reviewed journal articles in planning.

We will maintain a course website that will contain course information, course readings, handouts, data and links to relevant websites:

<https://blackboard.unc.edu/>

Texts

The following text is available at the student bookstore (it is also on-reserve in the Planning Library):

- K. Meier, and J. Brudney, *Applied Statistics for Public Administration*, Sixth Edition, Harcourt and Brace College Publishers, 2005.

In addition, there are several articles that you should review before the scheduled classes (see outline). More readings might be assigned during the semester.

The following are useful references, on-reserve in the planning library:

- E. Tufte, *Visual explanations: Images and quantities, evidence and narrative*, Graphics Press, 1997.
- L. Kahane, *Regression Basics*, Sage Publications, Inc., 2001.
- Kennedy, *A guide to Econometrics*, Third Edition, Massachusetts: MIT Press, 1992.
- R. Wonnacott and T. Wonnacott, *Introductory Statistics*, Fifth Edition, New York: John Wiley and Sons, Inc. 1990.
- R. Wonnacott and T. Wonnacott, *Econometrics*, Second Edition, New York: John Wiley and Sons, Inc. 1979.
- D. Huff, *How to lie with statistics*, W.W. Norton & Company, 1993

Prerequisites

This is a required course for entering MRP students (3.0 credits). The prerequisite for this course is the basic knowledge of descriptive statistics.

APPROACH

Quantitative methods are widely used in both public and private sector planning to inform decisions and build knowledge that helps reduce uncertainty in decision-making. Accordingly, this course emphasizes the following themes:

- Planning problems need to be structured. The structuring of problems requires that a theoretically plausible conceptual structure be developed. Investigators must conceptualize and theorize the relevant constructs and variables and then hypothesize the nature of relationships between the variables.
- Having structured the problem, researchers need to design their investigation and collect data on important variables. The data can be obtained from secondary sources (such as the Census) or primary sources (such as telephone interviews or mail-back surveys of the selected population).
- The data needs to be described, visualized and presented in a coherent manner.
- Statistical tools are used to understand the nature and properties of specific variables and their interrelationships. There can be considerable variation in the applicability of specific statistical methods, depending on the definition of the problem and availability of data.
- Planners need to draw logical implications from statistically based studies (for decision-making) and understand a study's contributions to planning knowledge, debate and human progress.

We will strive to help you think about planning issues in rigorous statistical terms. The statistical methodology taught in the class will provide one of the key lenses with which you can view and analyze planning problems and evaluate solutions. You will learn about techniques that can help you make decisions in complex planning situations, where you might have little control but can use powerful methods to develop insights, understand key relationships and predict outcomes. We will emphasize the statistical concepts and intuition (rather than mathematics) and the use of the Internet for obtaining data and learning statistical methods.

Requirements

The requirements for the course include:

- Attendance, readings and active class participation (5% of the grade).
- Assignments (25% of the grade).
- Final exam (25% of the grade).
- Final project (40% of the grade + 5% for presentation).

Students should read the assigned material before each class.

Assignments will include exercises that familiarize you with descriptive and inferential statistics and statistical models. Assignments are intended to help students understand the class materials and students are thus expected to work on them individually. In some instances, collaboration will be allowed when assignments are more difficult. Students can share ideas, but must ultimately reach a conclusion by themselves and hand back their own answer sheet. The extent to which collaboration is allowed will be mentioned on top of each assignment. Assignments will be handed out (and due back) according to the schedule below.

- Late homework assignments will not be accepted.
- You are expected to show all work on your assignments.
- Assignments should be turned in to the Teaching Assistant. They will be graded and returned during the following week.

For the Final Project, you will have the option of working on a topic in your area of specialization. Students will be asked to work on a dataset of their choosing, with the approval of Dr. Khattak. You will also have the option to work individually or in pairs. However, no more than two students should work together on their project.

There will be one final exam that will test students' knowledge of descriptive statistics, statistical inference and statistical relationships between variables.

Administrative Issues

Class Meeting Schedule changes

The dates of classes as planned are shown in this handout. The class is scheduled to meet generally at the regularly scheduled time. If it is necessary to reschedule a class, every effort will be made to accommodate the needs of as many students as possible. If you miss a class, please be sure to check for possible rescheduling of the following class at the course website.

Office Hours

The schedule of office hours for Asad Khattak will be Wednesday 2:15 PM-4:00 PM. You can make an appointment by calling me either in the office (Tel: 962-4760) or on my mobile (Tel: 259-3368). Please contact me if you have any questions, problems with the readings (or the course), or issues that you wish to discuss. Additionally:

- Xiaohong Pan (Room 318 New East) will have office hours on Thursday between 2:00 PM – 3:00 PM. You can also set up an appointment with her by email (xiaohong@email.unc.edu).

Software and Data

To reinforce course objectives and demonstrate/facilitate statistical analysis required for the class, data and computer software will be available. Important statistical software tools available in the DCRP computer lab are:

- Excel—a spreadsheet package that will be used to organize and graph data.
- SPSS—Statistical Package for Social Scientists—a statistical estimation package that will be used to model data. (1. Check the course website for tutorials. 2. The help menu in SPSS has a tutorial.)
- ArcView—A geographical information system software package.

Computer lab sessions will be offered during the semester in accordance with the schedule shown below to help students get familiar with the software packages that will be used in the class.

Various databases are available for analysis and estimation in your class project at the course website. They are related to various planning disciplines. It will be important for you to select the one that is closest to your area of interest and work on it for your class project.

The Honor Code

The University of North Carolina at Chapel Hill has had a student-administered honor systems and judicial system for over 100 years. Because academic honesty and trustworthiness are important to professional planning, this is a significant University and Departmental tradition. Your attention is called to the Instrument Student Judicial Governance for policies and procedures pertaining to the honor system.

OUTLINE

Lecture Sessions:

Class	Date	Topic
Foundations of Quantitative Analysis		
1	31-Aug	Introduction and overview
2	5-Sep	Labor Day - Class Held Tuftte (1997): Graphic display of data (On-Reserve in Planning Library) Major sources of planning-relevant data: Census, DOT, DOE, DOL, HUD, EPA
3	7-Sep	M & B Chapter 2: Measurement (common planning indicators)
4	12-Sep	M & B Chapter 3: Research Design
Descriptive Statistics and Probability		
5	14-Sep	M & B Chapter 4,5,6: Distributions, Central Tendency & Dispersion http://www.mathleague.com/help/ratio/ratio.htm Rates & proportions
6	19-Sep	M & B Chapter 7: Probability
7	21-Sep	M & B Chapter 8,9,10: Normal distribution, binomial & other distributions
Inferential Statistics		
8	26-Sep	M & B Chapter 11,12,13: Intro to Inference, Hypothesis Testing & Population Proportions
9	28-Sep	M & B Chapter 14: Testing Differences Across Groups
10	3-Oct	M & B Chapter 15,16,17: Contingency Tables
Regression Analysis		
11	5-Oct	M & B Chapter 18; Intro to Regression
12	10-Oct	M & B Chapter 19: Regression Assumptions
13	12-Oct	M & B Chapter 21; Multiple Regression
14	17-Oct	M & B Chapter 20 & 22; Time series
Advanced Regression Analysis		
15	19-Oct	Data Problems: Outliers, Missing data, Collinearity
16	24-Oct	Qualitative Independent Variables: Indicator variables, Interactions, Polynomial
17	26-Oct	Logistic Regression (Example in Planning)
GIS and Mapping		
18	3-Nov	Introduction to ArcGIS, creation of maps, creation of layouts, basic file mgt.
19	8-Nov	Creating shapefiles, importing/exporting data, joining data, editing tools for layers and tables
20	10-Nov	Geo-processing wizard, raster data
21	15-Nov	GIS lab session (Location TBA)
Applications (Guest speakers)		
22	17-Nov	Sonia Yeh
23	22-Nov	Ray Burby
24	24-Nov	Thanksgiving Break – No Class
25	29-Nov	Roberto Quercia
Review and Presentations		
26	1-Dec	Class presentations
27	6-Dec	Review (might have some remaining class presentations)
28	8-Dec	EXAM 12:00 Noon
	13-Dec	Final class project due at 12:00 Noon (you may submit it sooner)

Assignments

HW	Handed Out	Due Date	Topic
1	12-Sep	19-Sep	Choose your own topic and dataset for your final class project (Classes 3-4)
2	19-Sep	26-Sep	Descriptive statistics for your topic (Classes 5-7)
3	26-Sep	5-Oct	Hypothesis for your topic (Classes 8-9)
4	5-Oct	12-Oct	Bivariate Statistics for your topic (Classes 10-12)
5	12-Oct	3-Nov	Multiple regression for your topic (Classes 13-17)

Computer Lab Sessions*

Lab	Date given	Topic
1	15-Sep	Intro to SPSS, descriptive statistics (SPSS)
2	22-Sep	Histograms, descriptive statistics, distributions (Excel)
3	29-Sep	Testing differences across groups (SPSS)
4	6-Oct	Contingency tables (SPSS)
5	13-Oct	Linear Regression (SPSS)
6	27-Oct	Advanced Linear Regression (SPSS)

*Note: The Lab sessions will be Thursday 12:30 PM-01:45 PM at New East Computer Lab.

Review Sessions

To help you better understand the lectures and any topics from the class, we have total 8 review sessions. They are from 11:00AM-12:15PM in New East 305 on Sept. 9, Sept. 16, Sept. 23, Sept. 30, Oct. 7, Oct.14, and Oct. 28 (all are on Fridays).

Review sessions will be held in a lecture format. Those lectures will cover three main areas:

- Generalize the questions you asked during the week, and resolve any confusion
- Review lectures notes
- Discuss the main points of the assignments TA return to you.