

**CRP 5450: Inferential Statistics for Planning and Public Policy
Fall 2009**

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blackboard site: blackboard.cornell.edu. You need to self enroll to access the site.

My Office Hours: TBA

Teaching Assistants: TBA

Course Description: This course is an introduction to the inferential statistical methods and econometrics/regression analysis needed to understand empirical public policy and planning research and to do basic applied policy analysis. The statistical concepts are illustrated using data and examples primarily from the fields of public policy and planning.

In this course, you will learn to apply tools of quantitative analysis to study empirical evidence regarding real world events. The study of economics, planning and other social sciences is carried out through both theoretical and empirical inquiry. Theory typically refers to the study of models of the real world that are governed by assumptions that simplify them. These models outline what we expect to happen based on certain assumptions.

Empirical social science verifies relationships between various real world phenomena by evaluating data on these events through mathematical and statistical techniques. In other words, the empirics are used to test the validity of theoretical models. Inferential statistics and econometrics are comprised of the tools and techniques used to carry out this empirical analysis.

At the end of this course, you should be able to conduct your own basic empirical research, and you should be able to read and comprehend the empirical literature in field related journals such as the *Journal of Planning Education and Research*.

CRP 545 will emphasize hands-on experience with excel and SPSS and key data sources that will likely be useful in your professional work.

Comparable courses: Students who have taken another introduction to statistics or econometrics course such as ILRST 510, 511, 610 or BTRY 601, 602 or AEM 411 should not take this course.

Prerequisites: There are no prerequisites for this course. While no prior knowledge of statistics is needed, this course will cover significantly more material than a traditional introductory statistics course. For this reason, some discussions might seem brief especially for students with no prior statistics background. Students should utilize office hours for support and, please, feel free to speak up in class if you have questions.

Textbook(s): CRP 545 is essentially a combination of two courses—basic statistics and econometrics. Consequently, I have been unable to find a single, affordable textbook that perfectly meets this course’s needs. Instead, I will rely on two excellent textbooks and will put both of them on reserve in the Fine Arts Library. You can decide for yourself if you want to buy them. Both of them can be bought new or used on Amazon or other websites. Earlier editions of either book are fine. While, I don’t necessarily encourage the purchase of expensive textbooks, this course will require fairly heavy use of these books.

The first half of the semester we will primarily use:

De Veaux, R.D., P.F. Velleman and D.E. Bock (2006), *Intro Stats*, Pearson-Addison Wesley, 2nd or 3rd edition is fine.

The second half of the semester we will primarily use:

Studenmund, A.H. (2006) *Using Econometrics: A Practical Guide*, Pearson-Addison Wesley, 5th edition or 4th is fine.

In addition, the following book offers good advice on how to write an empirical paper or analysis. Chapters 2, 3, 9, 10, 11, 12 and 14 will be especially useful reading. It is also available on reserve in the Fine Arts Library.

Miller, J. E. (2005) *The Chicago Guide to Writing about Multivariate Analysis*, University of Chicago Press.

Additional readings will be posted on the course blackboard site as needed. In particular, examples of well-written empirical papers on a range of policy topics will be posted.

Software and Software manuals: We will be using both SPSS and Excel this semester. The software is provided on the classroom computers. You can also purchase a reduced price license for SPSS from the Cornell CIT website.

The following SPSS manual will be available to use in Sibley’s computer classroom:

Green, S.B. and N. J. Salkind, (2008) *Using SPSS for Windows and Macintosh*. Other SPSS manuals are available in the Mann library.

Other Resources on Campus:

1. Cornell Statistical Consulting Unit (CSCU) www.cscu.cornell.edu
CSCU offers daily office hours with staff statisticians to answer statistically questions pertaining to research projects. In addition, CSCU runs workshops on topics that are just beyond the scope of this course and would be a logical next step if you are interested in continuing to develop your empirical skills. For example, they typically have workshops on topics such as factor analysis and on dummy dependent variables with more than two categories. See the website for more information about office hours times and workshop schedules.
2. Cornell Institute for Social and Economic Research (CISER) www.ciser.cornell.edu
CISER runs workshops to introduce students and faculty to various software packages such as SPSS, SAS and STATA. Perhaps more importantly, they run workshops on how to use important social and economic data sets such as the census,

American Community Survey, BLS data and many more. See the website for more information about their workshops.

Academic Integrity

Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student's own work, except for group work clearly labeled as such on the course assignments. In this course, any problem sets can be done as group work.

Accommodations for students with disabilities

In compliance with the Cornell University policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances, so arrangements can be made.

Course Requirements and Evaluation:

Problem Sets – 50%

Problem sets will be assigned roughly every other week. There will be between 5 and 7 problem sets this semester. You are permitted to work in study groups on the problem sets, and you will always have at least 1 week to complete the assignment.

Empirical Project/Paper – 50%

The distribution of the empirical project grade is as follows:

1. Outline of project with data sources and an **annotated** bibliography – November 3 - 5%
2. First draft of project with your literature review, data set and descriptive statistics due November 19 – 5%
3. Final project due no later than 4:30 Monday December 14 - 40%

Guidelines for the various stages of the project will be passed out and discussed in class. In addition, Chapter 11 in the Studenmund textbook is a helpful guide to conducting and writing an empirical paper.

It would be ideal if students link their course projects to their thesis or a professional report.

Course Schedule:

August 27: Introduction to Data and Statistics
De Veaux et. al., Chapters 1 and 2

September 1-8: Descriptive Statistics including Correlation
De Veaux et. al., Chapters 3-6

February 10-17: Probability Theory and Probability Distributions

De Veaux et. al., Chapters 14-17

September 22 - October 1: Statistical Inference

De Veaux et. al., Chapters 18, 23, 19, 20, 24

October 6-8: More on Correlation and an introduction to Linear Regression

De Veaux et. al., Chapters 7 and 8

Studenmund, A. H., Chapter 1

October 15-29: Multiple Regression, the Assumptions of the Classical Linear Regression Model and Inference in Regression Analysis.

Studenmund, A. H., Chapters 2-4

November 3-12: Model Specification Issues- Choosing appropriate independent variables and functional forms, dummy independent variables and addressing multicollinearity

Studenmund, A.H., Chapters 6 - 8

November 17-24: An overview of practical strategies to deal with violations of the Classical Assumptions: Autocorrelation, Heteroscedasticity and Simultaneity.

Studenmund, A.H., Chapters 8-10.

December 1: Dummy dependent variable models—logit models

Studenmund, A. H., Chapter 13

December 3: Volunteer student presentations of interesting findings from their projects.