Course Time and Location:
  Friday  9:30-12:10
  ROOM
Instructor:  Jennifer Hill
Office Hours:  TBD

Course Goals and Prerequisites:
The goal of this course is to provide students with a basic knowledge of how to perform some more
advanced statistical methods useful in answering policy questions using observational or
experimental data. It will also allow them to more critically review research published that claims
to answer causal policy questions. The prerequisite is the first two semesters of quantitative
methods (E10.2003, E10.2004) or the equivalent as approved by the instructor.

Course Description:
Course provides students with a basic knowledge of both how to perform analyses and critique the
use of some more advanced statistical methods useful in answering policy questions. While
randomized experiments will be discussed, the primary focus will be the challenge of answering
causal questions using data that do not meet such standards. Several approaches for observational
data including propensity score methods, instrumental variables, difference in differences, fixed
effects models and regression discontinuity designs will be discussed. Examples from real public
policy studies will be used to illustrate key ideas and methods.

Course Timing:
The course will start meeting with Professor Hill on February 27th. Before that time, students will
be required to attend a 2 hour Stata tutorial, which will be pre-arranged with NYU’s ITS faculty.
By the first class the students are also required to have successfully completed the online
assignment that reviews the most important Statistics material they need to have mastered to
understand the course material.

Grading:
Grading will be based on approximately 5 homeworks (totaling 70%), and one final project or final
exam (30%) that will involve both data analysis and a thoughtful description of both the analysis
and the findings. One homework will involve a class presentation. Depending on the size of the
class, some assignments may be done in groups.

Reading materials
There is no required textbook for the course. The required readings are either available through e-
journals through the library or will be posted on Blackboard. The following two texts are
recommended, however:
Outline of course topics and readings:
The following outline describes the topics that will be covered along with anticipated associated readings. It corresponds roughly to the course weeks though we may end up adjusting time spent on each topic as we go. Readings highlighted with an * are recommended, not required. All readings not available on the web will be put on electronic reserve through Bobst library (BL). Web addresses for the others are provided.

1) Motivation: What's all the observational vs. randomized fuss about?
   Simple randomized experiments (theory and practice) and the Rubin Causal Model

   Morgan & Winship, Chapter 1


2) Randomized experiments (including Randomized Block and Matched Pairs Designs) and complications that make them look like observational studies


3) Observational Studies and simple ways of adjusting for covariates

Gelman, Andrew and Hill, Jennifer (2006) Chapters 9 and 10 of Data Analysis Using Regression and Multilevel/Hierarchical Models in press at Cambridge University Press (will be handed out in class) Chapter 9


4) Propensity Score Approaches – Theory


Rosenbaum, PR and D B. Rubin (1985) "Constructing a control group using multivariate matched sampling methods that incorporate the propensity score", The American Statistician, 39: 33-38 [Available at www.jstor.org]

5) Propensity Score Approaches – Practice (Stata)
Gelman, Andrew and Hill, Jennifer (2006) Chapters 9 and 10 of *Data Analysis Using Regression and Multilevel/Hierarchical Models* in press at Cambridge University Press (will be handed out in class) Chapter 10 read up to the section on regression discontinuity


6) **Instrumental Variables Models – Introduction and Theory**

Gelman, Andrew and Hill, Jennifer (2006) Chapters 9 and 10 of *Data Analysis Using Regression and Multilevel/Hierarchical Models* in press at Cambridge University Press Chapter 10 from beginning of IV section through to the end


7) **Instrumental Variables Models – Practice (Stata)**

8) Difference in Differences/ Fixed Effects models

[available on e-reserves]

ONLY PP 19-23

*Bogart & Cromwell. “How much is a neighborhood school worth?” J. Urban Economics 47


[Available through e-journals]

[Available through e-journals]

[available through e-journals]

9) Regression Discontinuity

