Syllabus

ENV-350 Program Evaluation of Environmental Policies
LSRC A-155
M/W 10:05-11:20

Nature and Purpose of the Course

This course is designed to give students a foundation in the methods and applications of program evaluation in environmental policy. Program evaluations seek to identify the causal effect of a program/regulation/policy on some outcome of interest. In the environmental area this often involves evaluating whether a program has actually had a causal effect on environmental quality. This class will enable students to be critical consumers of program evaluations and use these evaluations to improve policy outcomes.

The course has two components, theory and applications. The first component of the course helps students learn the major empirical methods in program evaluation. How do we actually measure the causal effect of a regulation on the environment? What type of information do we need to make valid inferences on policy effectiveness from data? The second component of the course applies these tools to domestic environmental policy choice. Students will read and analyze evaluations of the effectiveness of different policy instruments.

Prerequisites:

1. Students should be familiar with statistical testing and regression. ENV 210 “Applied Data Analysis” satisfies this prerequisite.

Intended Audience:

This course is intended for MEM students in all program areas. For students in the Environmental Economics and Policy program, this course will count as a major elective or a tools class. Master’s students in public policy, law, and business may also find the material relevant.
Required Readings:

The following textbook is highly recommended for the course:


Due to the fact that more than 10% of the book is assigned as reading in the course, chapters from the text cannot be made available via e-reserves. If you do not purchase the book (available at amazon and other online retailers) you will be responsible for ensuring that the readings are completed.

The other required readings for this course consist of that will be available through the Blackboard site. In addition, there will be detailed handouts for the lectures on statistical methods. These handouts serve as the “textbook” for this material.

Recommended Software:

It is recommended that students complete class assignments using STATA, a statistical software package. STATA is available in all of the computer labs at the Nicholas School. Students may wish to purchase their own version of STATA for use at home or on their laptops. STATA is available at a special student rate of $89 for a one-year license or $129 for a perpetual license. Please purchase INTERCOOLED STATA, *NOT* Small STATA.

Students are not required to use STATA. However, no support will be provided by the instructor or the teaching assistant for any other software programs. In addition, I highly recommend that students who are interested in program evaluation learn either STATA or SAS as these are the two programs that are most frequently used by agencies and firms that conduct social science program evaluations.

Course Requirements and Grading:

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<td>Problem Sets</td>
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<td>Reading Summaries</td>
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<td>Class Participation</td>
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Problem Sets

There will be four problem sets. The problem sets will require students to perform some statistical operations. It is highly recommended that students purchase STATA and use this program for the problem sets. Problem sets are due at the beginning of class. Problem sets are marked down 10% for each day (or part of a day) they are late.
Reading Summaries

There are 10 lectures during the semester that cover direct applications of program evaluation methods. For these 10 lectures (marked with ** in syllabus) students will write a 2 page (single spaced) summary and critique of the assigned readings. **Summaries must be submitted online on Blackboard by 11:59 p.m. the day prior to the class** where the papers will be discussed. Please see the Blackboard site for directions on how to submit assignments. Students will receive a check-plus (3 points), check (2 points) or check-minus (1 point) for their summaries. Late summaries will not be graded and will receive 0 points. I will drop the lowest two grades on the reading summaries (in other words you only have to do 8 of them).

Group Exercise

MEM students will work together in groups of 4-5 on one of five topics. The group will write a proposal that: (1) Describes the program, (2) Identifies the major outcomes to be examined, (3) Identifies major confounders, (4) Identifies data or data collection methods for both the outcome variables and the confounders, (5) Discusses the methods of evaluation that should be used along with their identifying assumptions and any weaknesses of the approach, (6) Provides a timeframe and budget for the analysis. This exercise is designed to mimic work professional students may encounter in future jobs in environmental policy consulting or in the non-profit world. **Students will present their proposals during the last week of classes. Written proposals are due by 11:59 p.m. on the last day of reading period—Sunday, April 27th.** Proposals must be submitted electronically using Blackboard. Please see the Blackboard site for instructions.

Ph.D. students enrolled in the course, will not participate in the group exercise. Instead, these students will select an estimation method not covered in class and make a presentation to the other Ph.D. students on this estimation method. What is it? What problem is it trying to address? When is it likely to be used? What are the identifying assumptions? Students must also write code to generate this estimator in either STATA or Matlab. **A short write-up of the estimator along with the programming code is due by 11:59 p.m. on the last day of reading period—Sunday, April 27th.** Papers must be submitted electronically using Blackboard. Please see the Blackboard site for instructions.

Some possible topics:
- Estimating treatment bounds
- Weak Instruments—Split Sample IV and JIVE
- Semiparametric and nonparametric Differences in Differences
- Local Average Response Functions and quantile regression
- Spatially-explicit treatment estimation
- Hazard models
Nicholas School Honor Code

All activities of Nicholas School students, including those in this course, are governed by the Duke Community Standard:

The Duke Community Standard

Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Citizens of this community commit to reflect upon and uphold these principles in all academic and nonacademic endeavors, and to protect and promote a culture of integrity.

To uphold the Duke Community Standard:

- I will not lie, cheat, or steal in my academic endeavors;
- I will conduct myself responsibly and honorably in all my endeavors; and
- I will act if the Standard is compromised

Schedule

January 9:  Introduction—What is Program Evaluation

January 14:  Review of Statistical Prerequisites I

Handout #1—Review of Statistical Prerequisites

January 16:  Review of Statistical Prerequisites II

Handout #1—Review of Statistical Prerequisites (continued)

January 21:  Martin Luther King Jr. Day  NO CLASS

January 23:  Causal Inference and Validity

Shadish, Cook and Campbell—Chapters 1-3

King, Keohane, and Verba—Chapter 3, pages 75-99

Handout #3—Causal Inference

January 25:  Intro to STATA 1-4 p.m. in ICL

**Ranking of Final Project Due on Blackboard by 5 p.m.**
January 28: Random Assignment and Experiments

Shadish, Cook and Campbell—Chapter 8

Handout #4—Random Assignment

Problem Set #1 Distributed

January 30: Application of Random Assignment to Environment and Health
**Reading Summary Due**

Peterson-Zwane, Alix, Edward Miguel and Michael Kremer “Spring cleaning: Results from a randomized impact evaluation of source water quality improvement” working paper


February 4: Assigning Randomly—This should be easy right?

Shadish, Cook and Campbell—Chapters 9-10

Handout #5—Problems with Random Assignment

February 6: India Case Study
**Written Case Summary Due**

See handout “India Case”

February 11: Selection on Observables—Regression

Handout #6—Selection on Observables 1

*Readings are Required for Ph.D. students and optional for MEM students*


February 13: Selection on Observables—Matching

Problem Set #1 Due at the beginning of class
Problem Set #2 Distributed

Handout #7—Selection on Observables 2

Readings are Required for Ph.D. students and optional for MEM students


February 18: Selection on Observables—Application to Environmental Policy
** Reading Summary Due**


February 20: Selection on Unobservables (1): Differences-in-Differences

Handout #8—Selection on Unobservables 1

Readings are Required for Ph.D. students and optional for MEM students
February 25: Applications of Differences-in-Differences (1)
**Reading Summary Due**

Problem Set 2 Due at the beginning of class
Problem Set 3 Distributed


February 27: Evaluating Program Evaluations—The Controversy over Observational Study Designs

MEM students should skim the following. Required for Ph.D. students


March 3: Selection on Unobservables (2): Instrumental Variables

Handout #9—Selection on Unobservables 2

Readings are Required for Ph.D. students and optional for MEM students


March 5: Applications of IV (1)
**Reading Summary Due**

Problem Set 3 Due at the beginning of class
Problem Set 4 Distributed


March 17: Applications of IV (2)
**Reading Summary Due**

Mark M. Pitt, Mark R. Rosenzweig, Md. Nazmul Hassan “Sharing the Burden of Disease: Gender, the Household Division of Labor and the Health Effects of Indoor Air Pollution” working paper.

March 19: Function Form IV
**Reading Summary Due**


March 24: Selection on Unobservables (3): Regression Discontinuity Designs

Handout #10—Regression Discontinuity

Textbook reading is required for all students
Shadish, Cook and Campbell—Chapter 7

The following readings are Required for Ph.D. students and optional for MEM students


March 26: Applications of RD
** Reading Summary Due**


March 31: The Role of Program Evaluation in Environmental Policy
** Reading Summary Due**

Problem Set 4 Due at the beginning of class


April 2: Institutions for Evaluation in Government
**Reading Summary Due**

Government Performance and Results Act of 1993


PART Assessments for the Environmental Protection Agency


April 7: MEM workday—NO Class
    Ph.D. students meet in Prof. Bennear’s office for Presentations

April 9: MEM Group Presentations, Groups 1 and 2

April 14: MEM Group Presentations, Groups 3 and 4

April 16: MEM Group Presentations, Group 5 and Course Evaluations