These lectures cover many of the empirical modeling strategies discussed in Mostly Harmless Econometrics (MHE). The main theoretical ideas are illustrated with examples, including recent applications. Topics to be covered include regression and matching, the construction and interpretation of instrumental variables estimates, differences-in-differences identification strategies, and regression discontinuity methods.

We'll have lectures every morning. In addition to lectures, participants will have the opportunity to present work in progress. The atmosphere is informal. I encourage questions and class discussion – I'll be asking you questions too!
Lecture 1: How Policy Experiments Reveal Cause and Effect (Chapters 1-2)

The Selection Problem
Experiments, IV, DD, and RD – an overview

Lectures 2: Regression (MHE 3.1-3.2)

Regression Mechanics
3 reasons to love
The long and short of regression anatomy

Causal Regression
Omitted variables bias
Potential outcomes
Causal vs. casual

Details
Limited dependent variables and marginal effects
Review of OLS asymptotics

Lecture 3: Matching and Training (MHE 3.3-3.4)

Matching and the CIA
Estimating the effect of treatment on the treated
Theoretical and empirical comparison of regression and matching

Training and the p-score
The propensity score theorem
The Lalonde/Dehejia-Wahba/Smith-Todd controversy
Why the p-score is just all right with me

Lectures 4-5: Instrumental Variables in Action (highlights from Chapter 4)

Constant-effects models
IV and omitted variables bias: estimating a long regression without controls
Two-stage least squares (2SLS); 2SLS lingo and mistakes
The Wald estimator, grouped data, and two-sample IV
The bias of 2SLS (4.6.4)

Instrumental variables with heterogeneous potential outcomes
Local average treatment effects; The compliers concept
IV in randomized trials
Average causal response in models with variable treatment intensity
Lecture 6: External Validity

Extrapolating: External Validity and Overidentification in the LATE Framework (Angrist and Fernandez-Val, 2011)

Lectures 7: Differences-in-Differences (Chapter 5)

**DD basics**
- The DD model; Regression DD
- DD assumptions and spec checks

**DD frontiers**
- Synthetic Controls (Abadie, Diamond, and Hainmueller, 2010)
- Changes-in-changes (Athey and Imbens, 2006)

Lecture 8-9: Regression Discontinuity Designs (Chapter 6)

**RD Theory**

**Application**

- The Elite Illusion (Abdulkadiroglu, Angrist, and Pathak, 2011)

Lecture 10: Summary and Wrap-up
READINGS


Many of the readings are from *MHE*. Published journal articles should be available in JSTOR. Working papers are available from online sources.

REGRESSION RECAP

*MHE*, Chapters 1-2 and 3.1-3.2

The first two chapters explain our experimentalist perspective on applied econometrics. Chapter 3 covers regression basics and more advanced topics related to regression and matching.

Limited dependent variables and marginal effects

*MHE* 3.4.2

Review of large-sample theory

*MHE* 3.1.3


MATCHING AND TRAINING

Matching

*MHE* 3.3.1


Training and the propensity score

*MHE* 3.3.2-3.3.3


**INSTRUMENTAL VARIABLES**

(Part 1:2SLS with constant effects; the Wald estimator, grouped data, two-sample IV)

*MHE*, Section 4.1


**2SLS Mistakes: MHE, Section 4.6.1.**

*The bias of 2SLS*

*MHE*, Section 4.6.4


**INSTRUMENTAL VARIABLES WITH HETEROGENEOUS POTENTIAL OUTCOMES**

*MHE*, Section 4.4


*Models with variable and continuous treatment intensity*

*MHE*, Section 4.5.3


*EXTERNAL VALIDITY*


*Differences-in-Differences*

*MHE*, Chapter 5


*Regression-Discontinuity Designs*

*MHE*, Chapter 6


