

# Advanced Impact Evaluation

Winter 2022

**Class meetings:** Mondays 13.30 - 15.10 & Wednesdays 8.50 - 10.30

**12 sessions:** 21 Feb. 2022 - 30 March 2022

**Course Number:** SOPP5078

**Instructor:** Anand Murugesan

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**Office hours:** MON: 15.30 - 16.30, QS C403

## Course overview

Evidence based policy making relies on the ability to combine causal methods and work with data. The course builds on the causal inference methods used to evaluate programs and policies, using the statistical software R.

We begin with a quick review of potential outcomes and the causal graph framework to build understanding of cause. We then extend the toolkit with advanced difference-in-difference methods such as event-study design, regression discontinuity design, instrumental variables, and techniques for correct statistical inference.

**Session format:** Short lectures on the concepts followed by lab work

**Prerequisites:** Impact Evaluation or adequate training in econometric methods.

## Course methods and materials

Program and policy evaluation requires practice. The in-class lab work, homework assignments, group project and exam are designed to help students master the techniques. The concepts will be presented via lectures and case studies, while the lab work with R aims building data skills. Students are encouraged to work in groups on the assignments. Class attendance and participation is highly encouraged and unjustified absences will be noted.

Students are required to prepare for class with the assigned readings. Additional materials (available as e-books in the CEU library) for those interested include:

1. Mastering 'Metrics: The Path from Cause to Effect (2014) by Joshua Angrist and Jörn Steffen Pischke.
2. [Causal Inference: The Mix Tape](#) (2021) by Scott Cunningham

## Course deliverables

- 2 Assignments (40%)
- Group project (20%)
- Quizzes/tests + Final exam (Cumulatively 40%)

Assignments solely carries the most weight as it is a learning-by-doing course, followed by assessments: besides the final exam, you could have up to four short in-class quizzes/tests.

## Grading scale

96	≤	A	≤	100
88	≤	A –	<	95
80	≤	B +	<	87
71	≤	B	<	79
63	≤	B –	<	70
58	≤	C +	<	62
0	≤	F	<	57

## Outline of sessions

1. Potential outcomes and causal graphs
  - Mastering ‘Metrics: The Path from Cause to Effect (Ch. 1)
  - Dayal and Murugesan (2021) Experiments (required reading)
  - Cunningham Scott (2018) Causal Inference: The Mixed Tape. Ch: Potential Outcomes Causal Model and DAGs
2. Randomization: Baseline and balance
  - Bruhn and McKenzie (2009): “In Pursuit of Balance: Randomization in Practice in Development Field Experiments,” AEJ: Applied, 1(4): 200–232
  - McKenzie (2012): “Beyond baseline and follow-up: The case for more T in experiments,” Journal of Development Economics, 2: 210–221
3. Difference-in-Differences (+ R session)
  - Angrist and Pishke (2009): Mostly Harmless Econometrics, chapter 5 Optional readings:
  - Bertrand, Duflo, and Mullainathan (2004): “How Much Should We Trust Differences- In-Differences Estimates?” QJE, 119 (1): 249–275

*Assignment 1 released*
4. Panel data and TWFE
  - Woolridge, Ch. 14 (Advanced Panel data)

- Carrell, S. E., & Hoekstra, M. L. (2010). Externalities in the classroom: How children exposed to domestic violence affect everyone's kids. *American Economic Journal: Applied Economics*, 2(1), 211-228

#### 5. Event-Study Design and Staggered DID

- Implementing the Panel Event Study (2020) by Clark and Schythe
- Cengiz, D., Dube, A., Lindner, A. and Zipperer, B., 2019. The effect of minimum wages on low-wage jobs. *The Quarterly Journal of Economics*, 134(3), pp.1405-1454.

#### 6. Regression discontinuity design

- Cunningham Scott (2021) *The Mixed Tape*. Ch. 6 on RDD
- Mastering 'Metrics: The Path from Cause to Effect (Ch. 4)
- Asher and Novosad (2020), *Rural Roads and Local Economic Development*, AER (supplementary reading for a recent application)

*Assignment 1* due

#### 7. Instrumental variables

- Angrist and Pishke (2009): *Mostly Harmless Econometrics*, chapter 4
- Imbens and Angrist (1994): "Identification and Estimation of Local Average Treatment Effects," *Econometrica*, 62(2): 467-475

*Assignment 2* released

#### 8. Instrumental variables II

- Cunningham Scott (2018) *Causal Inference: The Mixed Tape*. Ch: Instrumental Variables
- Madestam et al. (2013). Do Political Protests Matter? Evidence from the Tea Party Movement. *Quarterly Journal of Economics*, 1633-1685.

#### 9. Selection on observables

- Altonji, Elder, and Taber (2005): "Selection on Observed and Unobserved Variables: Assessing the Effectiveness of Catholic Schools," *JPE*
- Oster, E., 2019. Unobservable selection and coefficient stability: Theory and evidence. *Journal of Business & Economic Statistics*, 37(2), pp.187-204.

#### 10. Clustering and inference

- Abadie, A., Athey, S., Imbens, G.W. and Wooldridge, J., 2017. When should you adjust standard errors for clustering? (No. w24003). National Bureau of Economic Research.
- King, G. and Roberts, M.E., 2015. How robust standard errors expose methodological problems they do not fix, and what to do about it. *Political Analysis*, 23(2), pp.159-179.

*Assignment 2* due

11. Team presentations
12. **Class Test, TBA**
  - 80 minutes in-class test