

# Advanced Impact Evaluation

Winter 2023

**Class meetings:** Mondays 13.30 - 15.10 & Wednesdays 15.40 - 17.20 (QS D212)

**12 sessions:** February 20th 2023 - 29th March 2023

**Course Number:** DOPP5383

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

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## 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 (30%)
- Group/individual project presentation (20%)
- Discussion forum (10%)
- Individual term paper (40%)

Term paper have the highest weight as the course is designed to assist students in crafting an empirical paper (e.g., that can feed into their thesis). Assignments are weighted as implementation causal methods require learning-by-doing, followed by weight on individual presentations on their project (progress of the term paper). Discussions outside the classroom and preparation for class are encouraged with the discussion forum points.

## 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. Review of methods and discussion
  - Each student will discuss / present her goals in the course and make a 5 minute presentation on the research idea they would like to pursue (data, identification strategy, proposed methods)
2. Clustering and inference
  - Bertrand, Duflo, and Mullainathan (2004): “How Much Should We Trust Differences- In-Differences Estimates?” QJE, 119 (1): 249–275
  - 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.
3. Potential outcomes and causal graphs
  - Mastering ‘Metrics: The Path from Cause to Effect (Ch. 1)
  - Note be assigned
  - Cunningham Scott (2018) Causal Inference: The Mixed Tape. Ch. 4: Potential Outcomes Causal Model and DAGs

- Donald B Rubin (2005) Causal Inference Using Potential Outcomes, Journal of the American Statistical Association, 100:469, 322-331, DOI: 10.1198/016214504000001880

#### 4. Randomization: Balance and spillovers

- Bruhn and McKenzie (2009): “In Pursuit of Balance: Randomization in Practice in Development Field Experiments,” AEJ: Applied **pp. 200 - 207**
- Malani et al (2021): “Effect of Health Insurance in India: A Randomized Controlled Trial,” NBER Working paper (**required**)
- McKenzie (2012): “Beyond baseline and follow-up: The case for more T in experiments,” Journal of Development Economics, 2: 210–221 (recommended)
- Miguel, E. and Kremer, M., 2004. Worms: identifying impacts on education and health in the presence of treatment externalities. Econometrica, 72(1), pp.159-217. (recommended)

*Assignment 1* released

#### 5. 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)

#### 6. Counterfactual and Trends in Difference-in-Differences

- Abadie, A., Diamond, A. and Hainmueller, J., 2015. Comparative politics and the synthetic control method. American Journal of Political Science, 59(2), (pp.495 - 505, required)
- Mix Tape Ch. 10 (supplementary) <https://mixtape.scunning.com/synthetic-control.html?panelset2=r-code3panelset1=r-code2panelset=r-code>
- How Do Right-to-Carry Laws Affect Crime Rates? Coping with Ambiguity Using Bounded-Variation Assumptions, (pp 232 - 238, required)
- Roth, J., Sant’Anna, P.H., Bilinski, A. and Poe, J., 2022. What’s Trending in Difference-in-Differences? A Synthesis of the Recent Econometrics Literature. arXiv preprint arXiv:2201.01194.

*Assignment 1* due

#### 7. R Session (RDD + Synthetic Control)

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

- Implementing the Panel Event Study (2020) by Clark and Schythe
- Borusyak, K., Jaravel, X. and Spiess, J., 2021. Revisiting event study designs: Robust and efficient estimation. arXiv preprint arXiv:2108.12419.
- 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.

*Assignment 2* released

## 9. Instrumental variables

- Angrist and Pischke (2009): Mostly Harmless Econometrics, chapter 4
- Angrist, J.D. and Krueger, A.B., 1991. Does compulsory school attendance affect schooling and earnings?. The Quarterly Journal of Economics, 106(4), pp.979-1014.
- Imbens and Angrist (1994): "Identification and Estimation of Local Average Treatment Effects," Econometrica, 62(2): 467-475

## 10. 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.
- Andrews, I., Stock, J.H. and Sun, L., 2019. Weak instruments in instrumental variables regression: Theory and practice. Annual Review of Economics, 11, pp.727-753.

*Assignment 2 due*

## 11. 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.
- Nunn, N. and Wantchekon, L., 2011. The slave trade and the origins of mistrust in Africa. American Economic Review, 101(7), pp.3221-52.

## 12. Student Presentations