

# PhD in Economics and Management 2021-22

## MICROECONOMETRICS

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### OBJECTIVES

The course offers an applied economist's take on recent advances in the analysis of microeconomic data. We will see theory and – most important – applications. The focus of the course is on identification and estimation of causal effects using microdata.

### PRE-REQUISITES

Knowledge of OLS, IV, and panel data models at the level of a first-year graduate course in econometrics. I will briefly touch issues related with non-linear binary response models as well.

### EXAM AND GRADING

Possibly a written exam. Students will also carry out an empirical replication exercise, and present selected papers in front of the class at the end of the course.

### TOPICS

1. Talking about causality: potential outcomes and treatment effects. Research designs and their different shades of validity.
2. Randomization and randomized trials. Inference: clustering and the Moulton problem, randomization inference, the problem of multiple testing. Power calculation and minimum detectable effects.
3. Instrumental variables. Constant treatment effects (brief review). Heterogeneous treatment effects: the LATE theorem. Counting and characterizing compliers. Monotonicity and defiance. Testable implications of the LATE theorem: external validity and instrument validity. The case of variable treatment intensity: average causal response.
4. Sharp and fuzzy regression discontinuity designs: identification and inference. The regression probability kink design.
5. Linear (and non-linear) difference – in – differences. Event studies. Testing for parallel trends. Synthetic control methods. Inference in difference-in-differences and synthetic control methods.
6. Making do with observables: matching and regression. Big data, machine learning and the challenges and opportunities they offer for impact evaluation.

### REFERENCES

The key textbook is Angrist, J. D. and Pischke J.S. (2009). *Mostly Harmless Econometrics*.  
I will also present several journal articles and many applied examples.