# Syllabus

## Data Analysis 5: Experiments and causality

Department of Economics and Business
CENTRAL EUROPEAN UNIVERSITY

- **Instructor:** Gábor Békés (bekesg@ceu.edu office hours: Thursdays 16-17.15 by appointment)
- **Credits:** 2 (4 ECTS)
- **Term:** Winter 2017-2018
- **Course level:** [MA/MSc]
- **Prerequisites:** Data Analysis 1,2,3 (or Introductory Econometrics)

**Course description**

Data Analysis 5 covers the analysis of the effects of interventions. This course improves students' knowledge and skills to apply regression analysis in evaluating business and policy interventions. It also introduces students to the design of randomized experiments. Similar to Data Analysis 3 we focus on the most robust, credible and transparent methods, and we emphasize correct interpretation and convincing presentation. This course covers topics such as the design of randomized experiments, difference-in-differences analysis, and the use of time series regressions and panel data regressions to evaluate the effects of interventions.

**Learning outcomes**

- By successfully completing the course the students will be able to:
- Successfully formulate questions on the effects of interventions that are answerable by empirical analysis;
- Design simple randomized experiments when possible to measure such effects;
- Carry out regression analysis to estimate such effects from experimental data;
- Carry out regression analysis to estimate such effects from observational data, understand the limits of such analysis and assess their credibility;
- Discuss and interpret results of causal analysis, understand validity and constraints.
- Present empirical causal analysis and write short reports;
- Evaluate the merits of presentations and reports that carry out causal analysis.

**Reading list**

Data, codes and handouts will be provided.

**Assessment**

- Start-of-the-class Quizzes (10%)
- 3-4 Assignments (40%)
- Closed book exam (50%)

**Grading policy**

- Students shall not miss more than 2 lectures and more than 1 seminar. Failing to do so will yield an administrative fail grade.

- To pass, students will need to get at least 50% of the overall grade AND at least 50% of the exam. Failure to do so, will yield a Fail grade.

**Course schedule and materials for each session**

1 Causal analysis. Recap potential outcomes. Causality in regressions (confounders, selection, reverse causality)

2 Policy analysis with time series data

3 Diff-in-diffs. Panel regression in first diffs

4 Panel regressions: FE, pooled OLS, RE. Synthetic controls.

5 Doing experiments

6 Learning from natural experiments