



Universität Hamburg

DER FORSCHUNG | DER LEHRE | DER BILDUNG

UNIVERSITY OF HAMBURG
BUSINESS SCHOOL

Moorweidenstr. 18 – 20148 Hamburg

PhD Course

Econometrics

Block course

Time: January 14th – 16th, 2027

Place: Room 0029, Moorweidenstraße 18

Course instructor: Professor Martin Spindler (UHH)

Course value: 2 SWS or 5 LP (in “methods”)

Teaching language: English

Student evaluation: Presentation of a recent paper or own research project in a blocked session and written summary of a research project/idea

Registration: via STiNE

Course overview:

The target audience are empirical researchers/PhD students who want to apply those methods for their research and want to conduct empirical studies in management. The main goal of this course is to give an introduction to causal inference, and if time allows to recent developments, in particular on the use of Machine Learning Methods for Causal Inference. Handouts of the slides will be provided during the course. The participants should be equipped to conduct empirical studies and to be able to understand to utilize recent empirical articles in empirical economics.

Topics:

- 1) Introduction to Causal Inference / Potential Outcome Framework
- 2) Methods for Causal Inference (Diff-in-Diff, IV, Propensity Score Matching, Randomized Control Trials, ...)
- 3) Recent Developments

Recommended textbooks:

- Martin Huber: Casual Analysis. MIT Press (available online for free).
- Scott Cunningham: Causal Inference: The Mix Tape. Yale University Press (available online for free).
- Joshua Angrist and Jörn-Steffen Pischke: Mostly Harmless Econometrics.

Schedule (tentative):

Date	Times	Location	Topics
Day 1 (January 14 th)	8:30 - 10:00 10:15 - 11:45 13:00 - 14:30	0029, Mo 18	Introduction, Basics of Causal Inference, RCT, Diff-in-Diff, Instrumental Variables Estimation
Day 2 (January 15 th)	8:30 - 10:00 10:15 - 11:45 13:00 - 14:30	0029, Mo 18	Regression Discontinuity, Panel Data Methods, Propensity Score Matching
Day 3 (January 16 th)	8:30 - 10:00 10:35 - 11:45 13:00 - 14:30	0029, Mo 18	Current research papers and recent developments

References (advanced papers)

Efron, B. and T. Hastie. Computer Age Statistical Inference. Cambridge University Press 2016.
 Athey, Imbens, and Wager (2016). Approximate Residual Balancing: De-Bias Inference of Average Treatment Effects. arxiv.

Athey, Susan, and Guido Imbens. "Machine learning methods for estimating heterogeneous causal effects." arXiv preprint arXiv:1504.01132 (2015).

Athey and Imbens (2016). Recursive Partitioning for Heterogenous Causal Effects. PNAS.

Athey and Wager (2017). Estimation and Inference of Heterogenous Treatment Effects using Random Forests. JASA.

Bloniarz et al. (2015). Lasso Adjustment of Treatment Effect Estimates in Randomized Experiments. arxiv.

Belloni et al. (2017). Program Evaluation and Causal Inference With High-Dimensional Data. Econometrica.

Imbens, Guido W., and Donald B. Rubin. Causal inference in statistics, social, and biomedical sciences. Cambridge University Press, 2015.

Künzel et al. (2017). Meta-learners for Estimating Heterogenous Treatment Effects using Machine Learning. arxiv.

Powers et al. (2017). Some Methods for Heterogenous Treatment Effect Estimation in High-Dimensions. arxiv.