UNIVERSITY OF GOTHENBURG

DEPARTMENT OF EDUCATION AND SPECIAL EDUCATION

RQRM251, Estimating Causal Effects with Panel Data, 2.5 credits

Skattning av kausala effekter med hjälp av paneldata, 2,5 högskolepoäng

Third-cycle level / Forskarnivå

Confirmation

This syllabus was confirmed by the Department of Education and Special Education on 2025-12-17, and is valid from Spring semester 2026.

Responsible Department

Department of Education and Special Education, Faculty of Education

Entry requirements

The course presumes prior knowledge of basic statistics, including regression analysis, statistical inference and familiarity with the concept of causal inference. Experience with R (or equivalent software) is recommended.

Learning outcomes

Upon successful completion of the course, the doctoral student will be able to:

Knowledge and understanding

• Explain the identification conditions for Difference-in-Differences, fixed-effects models, and matched estimators.

• Describe how data structure affects estimator choice and statistical inference.

Competence and skills

• Implement different estimators in statistical software (R or Stata), including diagnostics and inference.

• Select and justify appropriate estimators and standard-error procedures for a given empirical application.

Judgement and approach

• Compare the strengths, limitations, and assumptions of estimators under different data-generating environments.

• Evaluate the credibility of causal claims in applied panel-data research.

• Assess the plausibility of parallel trends and propose alternative designs when it is unlikely to hold.

Course content

This course develops advanced tools for causal inference with panel data. The course provides an introduction to modern methods for causal inference with panel data. It covers the theoretical foundations of Difference-in-Differences, event-study designs, fixed-effects models, and matching-based estimators. Attention is given to identification strategies, diagnostics, and the interpretation of treatment effects under different data structures. The participants work with empirical applications and reproduce published analyses using statistical software, with a focus on practical implementation, assessment of underlying assumptions, and critical evaluation of causal claims.

Types of instruction

The course is organized around lectures and follow-up sessions involving hands-on exercises.

Language of instruction

The course is given in English

The language of instruction is English, unless all participants agree on Swedish.

Grades

The grade Pass (G) or Fail (U) is given in this course.

The grading scale includes the Fail (U) and Pass (G) grades. Pass means that the learning outcomes have been achieved.

Types of assessment

The course is examined through an individual home assignment that students develop and refine during the course period.

Course evaluation

The course will be evaluated after the course. The results will be used as a guide for improving the course.

Other information

Collaborating Departments: Department of Education and Special Education (department in charge), University of Gothenburg, in collaboration with Stockholm University, Uppsala Univeristy and Umeå University.

To participate in the course, access to own computer/laptop is needed together with computer accessories for online communication (camera, headphones, mic).

The number of participants is limited to 15.