University of St.Gallen

Course and Examination Fact Sheet: Spring Semester 2025

10,348: Causal panel methods

ECTS credits: 4

Overview examination/s

(binding regulations see below)
decentral - Written examination, Analog, Individual work individual grade (50%)
Examination time: Term time
decentral - Written work, Digital, Individual work individual grade (15%)
Examination time: Term time
decentral - Written work, Digital, Individual work individual grade (35%)
Examination time: Term time

Attached courses

Timetable -- Language -- Lecturer
10,348,1.00 Causal panel methods -- English -- Cunningham Scott

Course information

Course prerequisites

Econometrics preferred.

Learning objectives

Objective 1: to review contemporary work in causal methods covering difference-in-differences and synthetic control estimation.
Objective 2: to guide practitioner's through implementing these methods.

Course content

Causal inference is an advancing area within applied econometrics and statistics. It blends the common-sense approaches of empirically oriented researchers with the theoretical frameworks developed by econometricians and statisticians. The focus has increasingly been on establishing credible results about real-world policy and program impacts, separated from spurious and non-credible findings.

This course explores advancements in panel methods, focusing on two dominant, somewhat competing approaches: diffrence-in-differences and synthetic control. Key questions include: When should you use one method over the other? What are the data requirements? How do you make choices between methods?

The course covers both the theory and practice of these methods. Fundamentals will be reviewed alongside advanced topics curated by the professor. By the end of the course, students are expected to develop confidence, competency, and comprehension in their understanding and application of these methods.

Students will also listen to five podcast interviews with econometricians relevant to the content in class and write personal responses.

Course structure and indications of the learning and teaching design

• Outline:

1. Topic 1: Fundamentals of Difference-in-Differences covering unconditional parallel trends, conditional parallel trends and differential timing, including a checklist.
2. Topic 2: Traditional synthetic control and augmented synthetic control with comparative case studies.
3. Topic 3: Matrix completion with nuclear norm regularization, synthetic difference-in-differences.

• Teaching Methods: Lecture, coding exercises, discussion, podcast interview responses.

Course literature

• Required:
Baker, et al. (2024), "Difference-in-Differences: A Practitioner's Guide";
Arkhangelsky and Imbens (2024), "Causal Models for Longitudinal and Panel Data: A Survey"

• Recommended: Cunningham (2021; 2024) Causal Inference: the Mixtape

Additional course information

Scott Cunningham is a professor of economics at Baylor University, Research Fellow of the Baylor Collaborative on Hunger and Poverty, and Research Affiliate of the Computational Justice Lab. He is known for his work in the field of applied microeconomics, particularly in relation to the economics of sex work, substance use, and public policy. He also is widely recognized for popularizing advances in non-experimental impact evaluation methods (causal inference) and making it more accessible to practitioners. He wrote the Yale University Press textbook Causal Inference: The Mixtape.

Examination information

Examination sub part/s

1. Examination sub part (1/3)

Examination modalities

Examination type	Written examination
Responsible for organisation	decentral
Examination form	Written exam
Examination mode	Analog
Time of examination	Term time
Examination execution	Synchronous
Examination location	On Campus
Grading type	Individual work individual grade
Weighting	50%
Duration	--

Examination languages

Question language: English
Answer language: English

Remark

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Examination-aid rule

Closed Book

The use of aids is prohibited as a matter of principle, with the exception of pocket calculator models of the Texas Instruments TI-30 series and, in case of non-language exams, bilingual dictionaries without any handwritten notes. Any other aids that are admissible must be explicitly listed by faculty members in the paragraph entitled “Supplementary aids” of the course and examination fact sheet; this list is exhaustive.

Procuring any aids, as well as ensuring their working order, is the exclusive responsibility of students.

Supplementary aids

No external aids except for a phone for basic calculations

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2. Examination sub part (2/3)

Examination modalities

Examination type	Written work
Responsible for organisation	decentral
Examination form	Written work
Examination mode	Digital
Time of examination	Term time
Examination execution	Asynchronous
Examination location	Off Campus
Grading type	Individual work individual grade
Weighting	15%
Duration	--

Examination languages

Question language: English
Answer language: English

Remark

Response to podcast interviews.

Examination-aid rule

Free aids provision

Basically, students are free to choose aids. Any restrictions are defined by the faculty members in charge of the examination under supplementary aids.

Supplementary aids

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3. Examination sub part (3/3)

Examination modalities

Examination type	Written work
Responsible for organisation	decentral
Examination form	Written work
Examination mode	Digital
Time of examination	Term time
Examination execution	Asynchronous
Examination location	Off Campus
Grading type	Individual work individual grade
Weighting	35%
Duration	--

Examination languages

Question language: English
Answer language: English

Remark

Submitted coding exercises before written exam.

Examination-aid rule
Free aids provision

Basically, students are free to choose aids. Any restrictions are defined by the faculty members in charge of the examination under supplementary aids.

Supplementary aids
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Examination content

1. Outline Topic 1: Use of potential outcomes for the purpose of defining target parameters, estimation and identification in difference-in-differences.
2. Outline Topic 2: Detailed explanation of estimators, their calculations and data requirements (but not proofs).
3. Outline Topic 3: Understanding of design principles and the steps involved in a causal panel research project, pitfalls to avoid and required actions.

Examination relevant literature

To be announced.

Please note

Please note that only this fact sheet and the examination schedule published at the time of bidding are binding and takes precedence over other information, such as information on StudyNet (Canvas), on lecturers' websites and information in lectures etc.
Any references and links to third-party content within the fact sheet are only of a supplementary, informative nature and lie outside the area of responsibility of the University of St.Gallen.

Documents and materials are only relevant for central examinations if they are available by the end of the lecture period (CW21) at the latest. In the case of centrally organised mid-term examinations, the documents and materials up to CW 13 (Monday, 25 March 2025) are relevant for testing.

Binding nature of the fact sheets:

- Course information as well as examination date (organised centrally/decentrally) and form of examination: from bidding start in CW 04 (Thursday, 23 January 2025);
- Examination information (supplementary aids, examination contents, examination literature) for decentralised examinations: in CW 12 (Monday, 17 March 2025);
- Examination information (supplementary aids, examination contents, examination literature) for centrally organised mid-term examinations: in CW 14 (Monday, 31 March 2025);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised examinations: two weeks before ending with de-registration period in CW 15 (Monday, 07 April 2025).