University of St.Gallen

Course and Examination Fact Sheet: Spring Semester 2025

10,356: Recent Advances in the Econometrics of Optimal Policy Design

ECTS credits: 4

Overview examination/s

(binding regulations see below)
decentral - Active participation, Analog, Individual work individual grade (20%)
Examination time: Term time
decentral - Presentation, Analog, Individual work individual grade (30%)
Examination time: Term time
decentral - Presentation, Analog, Individual work individual grade (50%)
Examination time: Term time

Attached courses

Timetable -- Language -- Lecturer
10,356,1.00 Recent Advances in the Econometrics of Optimal Policy Design -- English -- Preinerstorfer David

Course information

Course prerequisites

Many decision problems in Economics concern the question which possibilities or treatments to choose in a data-driven way, possibly in dependence on observable characteristics. There is a highly active trend in the current econometrics literature to develop and analyse algorithms and statistical techniques to answer such questions, with many interesting connections to statistical learning theory and machine learning. The goal of this course is to introduce advanced students spezialicing in Economics and Econometrics to this exciting field and to enable them to read, appreciate, and comprehend articles in this vibrant domain, and to eventually contribute to this literature themselves.

Some maturity in mathematics and econometrics and the willingness to follow, understand, and present formal arguments is required.

Learning objectives

Recently, there has been a substantial amount of research in econometrics concerning the design of optimal policies. Essentially, the question is which ``treatment'' to choose, often based on observed characteristics, to maximize welfare of the population. Other objectives could concern the minimization of inequality or poverty. In practice, a relevant question could be, for example, which job training problem to choose for an individual based on a certain number of characteristics, such as education or previous experience.

This course introduces PhD students to current problems in this exciting, active research field, which also contains many open questions for future research.

Course content

The contents of the course are:

1. Decision theoretic tools
2. Experimental design based approaches to determine optimal policies
3. Empirical risk minimization based techniques
4. Sequential approaches and multi-armed bandits targeting welfare
5. Distributional targets, such as poverty or inequality

The focus of the course can be adapted to the specific interests of the participating students. If it fits the participating students' interests, the focus of this year's presentation part will be about fairness considerations in optimal treatment allocation problems.

Course structure and indications of the learning and teaching design

The course is blocked on 4 days (+ an online session in the beginning of the term, where presentation topics are distributed):

- During the first 2.5 days, topics are introduced in the form of interactive lectures.
- During the remaining 1.5 days, papers are presented and discussed by students and the lecturer. The papers presented by the students are distributed by the lecturer of the course, but suggestions of articles that fit the topic of the course will be taken into consideration.

Course literature

The following list of references provides a first overview of the topics covered in this class:

[0] Hirano, Keisuke, and Jack R. Porter. "Statistical decision rules in econometrics." Handbook of Econometrics 7 (2019).

[1] Manski, Charles F. "Statistical treatment rules for heterogeneous populations." Econometrica 72.4 (2004): 1221-1246.

[2] Hirano, Keisuke, and Jack R. Porter. "Asymptotics for statistical treatment rules." Econometrica 77.5 (2009): 1683-1701.

[3] Stoye, Jörg. "Minimax regret treatment choice with finite samples." Journal of Econometrics 151.1 (2009): 70-81.

[4] Bhattacharya, Debopam, and Pascaline Dupas. "Inferring welfare maximizing treatment assignment under budget constraints." Journal of Econometrics 167.1 (2012): 168-196.

[5] Manski, C. F., & Tetenov, A. (2016). Sufficient Trial Size to Inform Clinical Practice. Proceedings of the National Academy of Sciences, 113 (38), 10518-10523. doi:10.1073/pnas.1612174113.

[6] Kitagawa, Toru, and Aleksey Tetenov. "Who should be treated? empirical welfare maximization methods for treatment choice." Econometrica 86.2 (2018): 591-616.

[7] Athey, Susan, and Stefan Wager. "Policy learning with observational data." Econometrica 89.1 (2021): 133-161.

[8] Kasy, Maximilian, and Anja Sautmann. "Adaptive treatment assignment in experiments for policy choice." Econometrica 89.1 (2021): 113-132.

[9] Kitagawa, Toru, and Aleksey Tetenov. "Equality-minded treatment choice." Journal of Business & Economic Statistics 39.2 (2021): 561-574.

[10] Kock, Anders Bredahl, David Preinerstorfer, and Bezirgen Veliyev. "Functional sequential treatment allocation." Journal of the American Statistical Association (2021): 1-13.

Additional course information

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Examination information

Examination sub part/s

1. Examination sub part (1/3)

Examination modalities

Examination type	Active participation
Responsible for organisation	decentral
Examination form	Oral examination
Examination mode	Analog
Time of examination	Term time
Examination execution	Synchronous
Examination location	On Campus
Grading type	Individual work individual grade
Weighting	20%
Duration	--

Examination languages
Question language: English
Answer language: English

Remark
Active classroom participation

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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2. Examination sub part (2/3)

Examination modalities

Examination type	Presentation
Responsible for organisation	decentral
Examination form	Oral examination
Examination mode	Analog
Time of examination	Term time
Examination execution	Asynchronous
Examination location	On Campus
Grading type	Individual work individual grade
Weighting	30%
Duration	--

Examination languages
Question language: English
Answer language: English

Remark
Critical review of a scientific article + report

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

Examination languages

Question language: English
Answer language: English

Remark

Presentation of scientific paper + handout &slides

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

Every student gives a presentation of an article, which is followed by a critical discussion (concerning the content of the paper) by another student (who also writes a referee report). Active participation in the course is crucial.

The presentation (examination part 1) will be about a scientific paper fitting the topic of the course.

- Every presentation is followed by another (short) presentation (examination part 2) that critically discusses the paper presented and for which also a referee report has to be written.
- The distribution of presented papers (examination parts 1 and 2) will take place in an online session in the beginning of the semester, the date of which will be communicated via Canvas.

Examination relevant literature

The papers discussed in the presentations may be papers that are listed in the course literature above, papers that are follow-ups of these papers, or papers that fit the topic of the course and are suggested by the students. In any case, the relevant papers will be made available through Canvas prior to the presentation.

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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).