



## Course and Examination Fact Sheet: Spring Semester 2021

### 8,300: Data Analytics II: Causal Econometrics

ECTS credits: 4

#### Overview examination/s

(binding regulations see below)

Central - Written examination (60%, 60 mins.)

Examination time: inter-term break

Decentral - examination paper written at home (individual) (25%)

Examination time: term time

Decentral - Group examination paper (all given the same grades) (15%)

Examination time: term time

#### Attached courses

Timetable -- Language -- Lecturer

[8,300,1.00 Data Analytics II: Causal Econometrics](#) -- Englisch -- [Lechner Michael](#) , [Knaus Michael](#)

[8,300,2.01 Data Analytics II: Causal Econometrics: Exercises, Group 1](#) -- Englisch -- [Lechner Michael](#)

[8,300,2.02 Data Analytics II: Causal Econometrics: Exercises, Group 2](#) -- Englisch -- [Bodory Hugo](#)

[8,300,2.03 Data Analytics II: Causal Econometrics: Exercises, Group 3](#) -- Englisch -- [Okasa Gabriel](#)

#### Course information

##### Course prerequisites

It is assumed that students are familiar with the methods taught in Data Analytics I: Predictive Econometrics. Furthermore, the knowledge of an introductory econometrics course is assumed as well.

##### Learning objectives

Goal of the course is know and use modern data analytic and econometric tools for causal empirical studies. In particular, students will understand important concepts of Empirical causal analysis, like identification strategies and research designs. They will also learn to use suitable advanced data analytic causal estimators (classical estimators as well as causal machine learning estimators). Finally, students will learn how to code estimators in Python.

##### Course content

In the lecture part of the course, we will discuss research designs suitable to detect causal effects in empirical studies (selection-on-observables, instrumental variables, difference-in-difference, regression-discontinuity), as well as classical and machine learning estimators suitable in the particular research design. In the Lab sessions, the focus is on applying these method to empirical settings. In the self-study part, students create their own code in context of a Monte Carlo study. Coding in the Lab sessions and the Self-studies is based on Python.

##### Course structure

The course is in the first half of the term only. It consist of 7 lectures, 5 Lab sessions (contact studies), as well as a self-studies part. The contact studies part emphasise the statistical theory and its application. The self-studies part emphasis coding in Python (in groups). In 2021, the course is online only. Lecture are prerecorded and their will be a Q & A session for each lecture on Zoom. While the recordings of the lectures are available until the exam, the Q & A sessions will not be recorded. Lab sessions will also be held online.

##### Course literature

Wooldridge: Econometric Analysis of Cross-sectional and Panel Data, 2nd ed.



Angrist, Pischke: Mostly Harmless Econometrics.

Frölich, Sperlich: Impact Evaluation.

Athey, Imbens: The State of Applied Econometrics: Causality and Policy Evaluation. Journal of Economic Perspectives, 31, 3-32.

## Additional course information

In the case of the President's Board having to implement new directives due to the SARS-CoV-2 pandemic in SpS2021, the course information listed above will be changed as follows:

- There are no changes necessary to the course information.

The examination information listed above would be changes as follows:

- There are no changes necessary to the examination information.

As the course is online anyway, this concerns only the parts of the exams which are centralised. Here, we will follow the university wide rules. No other changes are necessary.

## Examination information

### Examination sub part/s

#### 1. Examination sub part (1/3)

##### Examination time and form

Central - Written examination (60%, 60 mins.)

Examination time: inter-term break

##### Remark

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##### Examination-aid rule

Open Book

Students are free to choose aids but will have to comply with the following restrictions:

- All the pocket calculators that are not of the Texas Instruments TI-30 series are explicitly inadmissible.
- In addition, any type of communication, as well as any electronic devices that can be programmed and are capable of communication such as electronic dictionaries, notebooks, tablets, mobile telephones and others, are inadmissible.
- Students are themselves responsible for the procurement of examination aids.

##### Supplementary aids

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##### Examination languages

Question language: English

Answer language: English

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#### 2. Examination sub part (2/3)

##### Examination time and form

Decentral - examination paper written at home (individual) (25%)

Examination time: term time

##### Remark

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## Examination-aid rule

Term papers

Term papers must be written without anyone else's help and in accordance with the known quotation standards, and they must contain a declaration of authorship which is a published template in StudentWeb.

The documentation of sources (quotations, bibliography) has to be done throughout and consistently in accordance with the chosen citation standard such as APA or MLA.

For papers in law, the legal standard is recommended (by way of example, cf. FORSTMOSER, P., OGOREK R. et SCHINDLER B., *Juristisches Arbeiten: Eine Anleitung für Studierende*, newest edition respectively, or according to the recommendations of the Law School).

The indications of the sources of information taken over verbatim or in paraphrase (quotations) must be integrated into texts in accordance with the precepts of the applicable quotation standard, while informative and bibliographical notes must be added as footnotes (recommendations and standards can be found, for example, in METZGER, C., *Lern- und Arbeitsstrategien*, newest edition respectively).

For any work written at the HSG, the indication of the page numbers is mandatory independent of the chosen citation standard. Where there are no page numbers in sources, precise references must be provided in a different way: titles of chapters or sections, section numbers, acts, scenes, verses, etc.

## Supplementary aids

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## Examination languages

Question language: English

Answer language: English

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## 3. Examination sub part (3/3)

### Examination time and form

Decentral - Group examination paper (all given the same grades) (15%)

Examination time: term time

### Remark

Maximum group size is 2.

## Examination-aid rule

Term papers

Term papers must be written without anyone else's help and in accordance with the known quotation standards, and they must contain a declaration of authorship which is a published template in StudentWeb.

The documentation of sources (quotations, bibliography) has to be done throughout and consistently in accordance with the chosen citation standard such as APA or MLA.

For papers in law, the legal standard is recommended (by way of example, cf. FORSTMOSER, P., OGOREK R. et SCHINDLER B., *Juristisches Arbeiten: Eine Anleitung für Studierende*, newest edition respectively, or according to the recommendations of the Law School).

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## Supplementary aids

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## Examination languages

Question language: English

Answer language: English

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## Examination content

Research designs suitable to detect causal effects in empirical studies.

Classical and machine learning estimators suitable in the particular research design.

Application and Monte Carlo studies with Python.

## Examination relevant literature

Wooldridge: Econometric Analysis of Cross-sectional and Panel Data, 2nd ed.

Angrist, Pischke: Mostly Harmless Econometrics.

Frölich, Sperlich: Impact Evaluation.

Athey, Imbens: The State of Applied Econometrics: Causality and Policy Evaluation. Journal of Economic Perspectives, 31, 3-32.

## 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 12 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, 28 January 2021);
- Examination information (regulations on aids, examination contents, examination literature) for decentralised examinations: in CW 12 (Monday, 22 March 2021);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised mid-term examinations: in CW 12 (Monday, 22 March 2021);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised examinations: two weeks before the end of the registration period in CW 14 (Thursday, 8 April 2021).