



Course and Examination Fact Sheet: Autumn Semester 2019

7,310: Data Analytics I: Predictive Econometrics

ECTS credits: 4

Overview examination/s

(binding regulations see below)

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

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

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

Attached courses

Timetable -- Language -- Lecturer

[7,310,1.00 Data Analytics I: Predictive Econometrics](#) -- Englisch -- [Strittmatter Anthony](#) , [Mareckova Jana](#) , [Boller Daniel](#)

Course information

Course prerequisites

Econometrics on bachelor level, basic knowledge of statistics. Experience with the statistical software R.

Course content

This course gives an introduction to statistical properties that are used in econometrics. In particular, the statistical properties of linear regression models are derived. These properties are often required to draw causal inferences. However, it turns out that some machine learning estimators that are not suited for causal inference can outperform standard estimators in terms of prediction power. During the rest of the lecture the prediction properties of several estimators are discussed. Several supervised and unsupervised machine learning estimators are covered. Resampling methods (such as cross-validation and cross-fitting) are introduced.

Furthermore, in 5 PC-lab sessions the students will have the opportunity to apply the topics discussed during the lectures to real and simulated data to sharpen their intuition and get an idea about the practical relevance of the methods. Students have to solve some problems at home. Furthermore, they have to write an empirical term paper.

Course Outline:

1. Basic Econometric Concepts
2. Properties of Linear Estimators
3. Prediction vs. Causal Inference
4. Supervised Machine Learning Methods
5. Unsupervised Machine Learning Methods

Course objectives:

- The course familiarizes students with basic econometric and statistical methods.
- The course prepares students to analyse real world empirical prediction problems (conceptual and applied).
- Students work with real data and R software packages.

Study goals:

- Students will know different empirical prediction methods.
- Students will be able to select appropriate prediction methods.
- Students will be able to assess the quality of prediction studies.
- Students will be able to conduct small prediction studies on their own.



Course structure

7 lectures, 5 PC-lab session including econometric projects in groups.

Course literature

Wooldridge (2010): "Econometric Analysis of Cross Section and Panel Data".

Hastie, Tibshirani, Friedman (2009): "The Elements of Statistical Learning".

Additional course information

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Examination information

Examination sub part/s

1. Examination sub part (1/3)

Examination time and form

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

Remark

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Examination-aid rule

Extended Closed Book

The use of aids is limited; any additional aids permitted are exhaustively listed under "Supplementary aids". Basically, the following is applicable:

- At such examinations, all the pocket calculators of the Texas Instruments TI-30 series and mono- or bilingual dictionaries (no subject-specific dictionaries) without hand-written notes are admissible. Any other pocket calculator models and any electronic dictionaries are inadmissible.
- In addition, any type of communication, as well as any electronic devices that can be programmed and are capable of communication such as notebooks, tablets, PDAs, 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

2. Examination sub part (2/3)

Examination time and form

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

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.
- The documentation of sources (quotations, bibliography) has to be done throughout and consistently in accordance with



the APA or MLA standards. The indications of the sources of information taken over verbatim or in paraphrase (quotations) must be integrated into the text 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. (2017), Lern- und Arbeitsstrategien (12th ed., Cornelsen Schweiz).

- For any work written at the HSG, the indication of the page numbers both according to the MLA and the APA standard is never optional.
- 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.
- For papers in law, the legal standard is recommended (by way of example, cf. FORSTMOSER, P., OGOREK R. et SCHINDLER B. (2018, Juristisches Arbeiten: Eine Anleitung für Studierende (6. Auflage), Zürich: Schulthess, or the recommendations of the Law School).

Supplementary aids

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Examination languages

Question language: English

Answer language: English

3. Examination sub part (3/3)

Examination time and form

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

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.
- The documentation of sources (quotations, bibliography) has to be done throughout and consistently in accordance with the APA or MLA standards. The indications of the sources of information taken over verbatim or in paraphrase (quotations) must be integrated into the text 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. (2017), Lern- und Arbeitsstrategien (12th ed., Cornelsen Schweiz).
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Supplementary aids

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Examination languages

Question language: English

Answer language: English

Examination content

All material that is covered in the lectures and PC-lab sessions.

Examination relevant literature

Wooldridge (2010): "Econometric Analysis of Cross Section and Panel Data".



Hastie, Tibshirani, Friedman (2009): "Elements of Statistical Learning".

Relevant are only the chapters covered during the lectures and PC-lab sessions.

Please note

Please note that this fact sheet alone is binding and has priority over any other information such as StudyNet (Canvas), personal databases or faculty members' websites and information provided in their lectures, etc.

Any possible references and links within the fact sheet to information provided by third parties are merely supplementary and informative in nature and are outside the University of St.Gallen's scope of responsibility and guarantee.

Documents and materials that have been submitted no later than the end of term time (CW51) are relevant to central examinations.

Binding nature of the fact sheet:

- Information about courses and examination time (central/decentral) and examination type starting from the beginning of the bidding on 22 August 2019
- Information about examinations (examination aid regulations, examination content, examination-relevant literature) for decentral examinations after the 4th semester week on 14 October 2019
- Information about examinations (examination aid regulations, examination content, examination-relevant literature) for central examinations as from the starting date for examination registration on 4 November 2019

Please consult the fact sheet again after these deadlines have expired.