



Course and Examination Fact Sheet: Autumn Semester 2019

7,305: Statistics

ECTS credits: 4

Overview examination/s

(binding regulations see below)

Decentral - Oral examination (individual) (100%, 20 mins.)

Attached courses

Timetable -- Language -- Lecturer

[7,305,1.00 Statistics](#) -- Englisch -- [Audrino Francesco](#)

Course information

Course prerequisites

Bachelor level knowledge of Mathematics, Statistics, and Econometrics similar to the one gained in the Bachelor in Economics at the HSG (for example, having followed the course "3.222 Statistics").

Course content

Introductory course in Probability and Statistics for Master students.

The course will emphasize topics needed in the further study of economics, finance, and econometrics and will provide the needed quantitative preparation for the understanding and analysis of the different economic and financial applications taught in the later terms.

Course objective: Students will learn how to deal with stochastic environments and will be able to work properly under conditions where uncertainty plays a major role. Moreover, students will identify and estimate key quantities (parameters) that drive the distributions of the relevant random variables under investigation

Course structure

1. Main probability distributions employed in statistical modeling: the discrete case

- Discrete probability functions and distribution functions
- Special discrete distributions
- Relations among certain discrete distributions
- Expectation and other moments
- Multivariate discrete distributions
- Moment generating function

2. Main probability distributions employed in statistical modeling: the continuous case

- Probability density function and cumulative distribution function
- Special continuous distributions
- Expectation and other moments
- Multivariate continuous distributions
- Moment generating function
- Distribution of functions of continuous random variables
- Estimation of distribution functions and probability density functions: the empiric distribution function



3. Point estimation

- The point estimation problem
- The method of least squares
- Maximum likelihood estimation
- The method of moments

4. Confidence sets and tests of hypothesis

- Excursus: The Central Limit Theorem
- Confidence interval
- Confidence set and its construction
- Test of hypothesis

5. The likelihood-ratio test and alternative "large-sample" equivalents of it

- Testing normal means and normal variances
- The likelihood-ratio test
- The chi-squared test

Course literature

Mandatory literature:

- Lecture Notes

Recommended literature:

- E.J. Dudewicz and S.N. Mishra, *Modern mathematical statistics*, Wiley, New York, 1988

Additional course information

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Examination information

Examination sub part/s

1. Examination sub part (1/1)

Examination time and form

Decentral - Oral examination (individual) (100%, 20 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

None

Examination languages

Question language: English

Answer language: English

Examination content

- 1. Main probability distributions employed in statistical modeling: the discrete case**
 - Discrete probability functions and distribution functions
 - Special discrete distributions
 - Relations among certain discrete distributions
 - Expectation and other moments
 - Multivariate discrete distributions
 - Moment generating function
- 2. Main probability distributions employed in statistical modeling: the continuous case**
 - Probability density function and cumulative distribution function
 - Special continuous distributions
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 - Confidence interval
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- 5. The likelihood-ratio test and alternative "large-sample" equivalents of it**
 - Testing normal means and normal variances
 - The likelihood-ratio test
 - The chi-squared test

Examination relevant literature

- Lecture Notes (available on Studynet at the beginning of the teaching term)



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.