# University of St.Gallen

## Course and Examination Fact Sheet: Autumn Semester 2021

## 3,222: Data Analytics I: Statistics (Economics)

## ECTS credits: 6

## Overview examination/s

(binding regulations see below)
Central - Written examination (100%, 120 mins.)
Examination time: inter-term break

## Attached courses

Timetable -- Language -- Lecturer
3,222,1.00 Data Analytics I: Statistics (Economics) -- Englisch -- Audrino Francesco
3,222,2.01 Data Analytics I: Statistics (Economics): Exercises, Group 1 -- Englisch -- Chassot Jonathan
3,222,2.02 Data Analytics I: Statistics (Economics): Exercises, Group 2 -- Englisch -- Senn Erik-Jan

## Course information

### Course prerequisites

No prior preparation in probability and statistics is required, but familiarity with basic algebra and calculus is expected.

### Learning objectives

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 distribution of the relevant random variables under investigation.

### Course content

Introductory course in probability and statistics with some basic economic applications.

The main essential ingredients taught are:elements of probability theory, sampling theory, and statistical estimation. It uses elementary econometrics and other applications of statistical tools to economic data. It also provides a solid foundation in probability and statistics for economists.

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

### Course structure and indications of the learning and teaching design

The lecture is organized in the form of frontal classes and individual and/or in group exercises. During the different classes we will alternate between the definition of new theoretical concepts and the solution of exercises. This will provide a dynamic environment and facilitate the discussion between teacher and students. Some exercises and practical applications will be shown using a computer (R-software).

Tuesdays classes will be taught in presence whereas Wednesdays classes will be taught online via Zoom.

The discussed subjects are:

- Probability theory: the building blocks
  - Random experiments
  - Probability models
  - Probability computation rules

- - Basic theorems
- Combinatorial methods
- Random variables: definition and properties
- Special distributions
- Multivariate random variables
  - Joint, marginal, and conditional distributions
  - Expectation, variance, and correlation
  - Sums and sample means of random variables
- The Central Limit Theorem (CLT)
- Descriptive statistics
- Estimation of unknown parameters
- Confidence intervals

## Course literature

**Mandatory:**

- F. Audrino, script from lecture (available on Studynet at the beginning of the teaching term).

**Recommended:**

- M. H. DeGroot and M. J. Schervish, "Probability and Statistics", fourth international edition, Pearson Education, Inc. (2012)
- M. Barrow, "Statistics for economics, accounting and business studies", sixth edition, Pearson Education, Inc. (2013)
- D. Anderson, D. Sweeney, T. Williams, J. Freeman, and E. Shoesmith, "Statistics for Business and Economics", third edition, CENGACE Learning (2014).
- J. Schira, "Statistische Methoden der VWL und BWL: Theorie und Praxis", 3. Auflage, Pearson Studium (2009) - in German

## Additional course information

In the case of the President's Board having to implement new directives due to the SARS-CoV-2 pandemic in AS2021, the course information listed above will be changed as follows:

- The course is conducted enitrely online via the platform Zoom;
- The lecturer informs via StudyNet and e-mail on the changed implementation modalities of the course; There are no changes necessary to the examination information.

# Examination information

## Examination sub part/s

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

### Examination time and form
Central - Written examination (100%, 120 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 content

- Probability theory: the building blocks
    - Random experiments
    - Probability models
    - Probability computation rules
    - Basic theorems
- Combinatorial methods
- Random variables: definition and properties
- Special distributions
- Multivariate random variables
    - Joint, marginal, and conditional distributions
    - Expectation, variance, and correlation
    - Sums and sample means of random variables
- The Central Limit Theorem (CLT)
- Descriptive statistics
- Estimation of unknown parameters

Confidence intervals

## Examination relevant literature

F. Audrino, script from lecture (available in Studynet at the beginning of the teaching term).

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## Please note

Please note that only this fact sheet and the examination schedule published at the time of bidding are is 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 (CW51) at the latest. In the case of centrally organised mid-term examinations, the documents and materials up to CW 42 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 34 (Thursday, 26 August 2021);
- Examination information (regulations on aids, examination contents, examination literature) for decentralised examinations: in CW 42 (Monday, 18 October 2021);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised mid-term examinations: in CW 42 (Monday, 18 October 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 45 (Monday, 8 November 2021).