Introduction to Statistics for Social Sciences

Fall 2025

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Time of lecture: Wednesday, 12:15 - 14:00 – **Location**: 4.A05
Time of tutorat: Wednesday, 14:15 - 16:00 – **Location**: 3.B57

Course Descrition

Statistics is an important skill in the social sciences for empirically testing our theoretical ideas. Statistics uses data to describe objects and ideas, and to draw conclusions about the population from random samples. If you are motivated to learn statistics and data science but feel insecure, this "Introduction to Statistics for the Social Sciences" is for you. The course is designed for beginners. The course emphasizes the application of ideas rather than mathematical proofs. As a student, you will learn the important statistical concepts while applying the learned knowledge using the statistical software R. R is open source and therefore free for everyone to use. If you are the type of person who wants to learn something without investing time, this course is not for you. To learn statistics it's important to practice every week. There will be exercises in OLAT to practice and apply the skills. The course is structured as follows: In the first part we describe data. To describe data, we learn what data is and how to read data into R, how data looks like and how we can recode data to get it on the right scale, we learn and apply different descriptive statistics and plot the data. We then learn about different distributions and probability theory as a prerequisite for inferential statistics: What can we learn from a sample about the population from which it was drawn? We then apply inference statistics to simple hypothesis testing and the linear regression model.

Is this Course for you?

This course introduces key statistical concepts for addressing social science research questions using quantitative (large-N) data sets. The primary learning objectives are to become familiar with statistical foundations, to independently analyze data for personal work/research, and to critically evaluate statistical claims reported in the news media, policy reports, and academic research. You should take this course if you

- Want to use statistical methods in seminar papers, theses, and future work
- Have an interest in social science research questions
- Want to acquire the coding and computational skills needed to import, transform, visualize, and model data
- You are willing to spend a significant amount of time outside the classroom each week studying and practicing the course material.

Course Requirements

An intrinsic motivation to learn statistics is the only hard requirement for this course. Passive, listen-only, and credit-oriented attendance styles are discouraged as they undermine effective and lasting learning. The technical requirement for this course is to register on the OLAT page of this course, since the materials will be made available on OLAT.

Goals of the lecture

The goal of this course is to provide an introduction to statistics for the social sciences. We start by describing data. During the semester we will learn how to make inferences about the population from random samples. We will apply this first to simple hypothesis testing and then to linear regression.

The learning outcomes are:

- Understand the scientific methods and their application and relevance in the social sciences.
- You will have basic R skills.
- Know how to present and interpret statistical information.
- Understand descriptive and inferential statistics and the difference between them.

Assignment

The assignment consists of two parts:

- There will be weekly **mini exams** in OLAT. You have to do them alone. You should only use an A4 sheet of handwritten notes, a calculator and a dictionary if you have language difficulties. You must take the mini-exams by midnight before the next week's lecture. You will pass the mini-exam if you get at least 50% of the points. If you pass at least 10 mini-exams, you will get a 6 for the mini-exams, for 9 you will get a 5.5, and so on. The mini-exams count **10%** towards your final grade. This means that if you get a 6, you can pass the course with a 3.5 on the final exam. There will be no make-up exams for the mini-exams.
- There will be a **final exam** that counts **90%** towards your final grade (**Wednesday, December 17, 2025, 14:15-15:45**). If you fail it, there will be a make-up exam (**Tuesday, February 3 or 10, 2015, 10:15-11:45**). You may bring a calculator and one A4 sheet of handwritten notes (you may use both sides). Copies of other sheets are not allowed, as it is important that you write them yourself for the learning process.

Estimated Workload

The estimated weekly workload for this course is (~6-7.5h)

- 1h 30min class attendance
- 2-3h reading, studying, reviewing theoretical concepts
- 1-2h doing the weekly exercises to practice R (if you have never worked with R before, the time needed may be higher)
- 45min solving the OLAT self-tests and discussing them with peers to prepare for the mini-exam
- 15min solving the mini-exam in OLAT

Optional Tutorat

There is an optional tutorat which you can book which is held in German and takes place every week after the lecture. The assigment will consist of four homeworks. The main target group are the BA students but it can also be booked by MA students. There will be no tutorat in the last week after the exam.

- Homework 1 – read, recode and visualize data – Beginn: 8.10.25 16:00 – **Deadline: 21.10.25 14:00**
- Homework 2 – descriptive statistics and distributions – Beginn: 22.10.25 16:00 – **Deadline: 4.11.25 14:00**

- Homework 3 – applyied hypothesis testing – Beginn: 12.11.25 16:00 – **Deadline: 25.11.25 14:00**
- Homework 4 – linear regression – Beginn: 3.12.25 16:00 – **Deadline: 16.12.25 14:00**

Program

Week	Date	Content	R
1	17.9.25	Course Organization, What are methods?	Installing R and R Studio
2	24.9.25	What is data?	Reading data in R, selecting variables and cases
3	1.10.25	Concepts, operationalization, scales	Recoding variables in R
4	8.10.25	Visualization	Using ggplot2 in R to plot graphs
5	15.10.25	Descriptive Statistics	Descriptive Statistics in R
6	22.10.25	Distributions	Using Distributions in R
7	29.10.25	Probability Theory, Central Limit Theory, Confidence Intervals	Simulating Central Limit Theory in R
8	5.11.25	Hypothesis Testing	Univariate t-Test in R
9	12.11.25	Apply Hypothesis Testing	Correlation, Cramers V, Bivariate t-Test, χ^2-Test, Spearman's ρ, Kendall's τ
10	19.11.25	Univariate Linear Regression	Scatterplot and Linear Regression in R
11	26.11.25	Adding Control and Dummy Variables; Variable Importance and Model Comparison	Multiple Linear Regression in R; Variable Importance in R, R^2, adj. R^2, AIC/BIC
12	3.12.25	Interactions in the Linear Model	Modeling Interactions in R
13	10.12.25	Sneak Peak on Causality, Summary, Feedback	
14	17.12.25	**Exam**	