APPLIED STATISTICS FOR SOCIAL AND POLITICAL SCIENCES

Year 2023/2024

Spring term, Year 1

Instructors: Daniel Auer, Elena Pisanelli, Aron Szekely

Hours: 40 (20 hrs of lectures, 20 hrs of STATA lab)

Requirements

No formal requirements in the Allievi Program.

Recommended preliminary readings:


Course Aim

The aim of this course is to provide you with the core statistical and conceptual tools needed to understand and conduct reliable empirical research in the social and political sciences.

At the end of the course, you should be able to:

1) display and explore data, compute and graph linear relations, understand basic probability distributions and statistical inferences, and simulate random processes to forecast uncertainty

2) build, fit, understand, use, and assess the fit of linear regression models and be have a basic understanding of logistic regression models.

3) understand the assumptions underlying causal inference and perform causal inference in simple experimental settings using regression to estimate treatment effects

Reference textbooks


Additional reading material can be assigned in some weeks.

**Evaluation**

After the end of the course, students will be assigned a research question and a dataset to work with. They are expected to develop a (statistical) strategy to address the research question, apply it to the data, and report the results in a short essay.

**Outline**

Each week consists of a 2-hour lecture, where topics will be presented from a theoretical and intuitive way, and a 2-hour hands-on tutorial, which will guide you to the application of each topic with the statistical software STATA. You are expected to read the assigned material before each class.

Week 1: Review of descriptive statistics  
Week 2: Understanding probability, understanding your data  
Week 3: Statistical inference  
Week 4: Statistical analysis in practice  
Week 5: Bivariate hypothesis testing  
Week 6: Linear regression with one predictor  
Week 7: Linear regression with multiple predictors  
Week 8: Behind regression: assumptions, diagnostics, and evaluation  
Week 9: Introduction to logistic regression  
Week 10: Statistical and causal inference