Applied Quantitative Methods

Summer Semester 2025
Monday, 14.15 – 15.45, C 12.015 Seminar room

Instructor: Prof. Dr. Hana Attia
Email: hana.attia@leuphana.de
Office Hours: Tuesday, 11:00-12:00 (by appointment)
Office Location: Room C4.024

Course Description

As quantitative data play an increasingly important role in academia and beyond, developing strong data literacy and quantitative research skills is essential. This course combines theoretical models with empirical research to deepen our understanding of politics. Students will learn key quantitative methods for analyzing a wide range of political phenomena and will be guided through the core steps of empirical political science research—from formulating research questions and deriving hypotheses to testing them using quantitative methods. The course also provides an introduction to the statistical program STATA, equipping students with the skills needed to conduct their first independent empirical analysis.

Structure

The class is structured into two blocks. The first block will begin with input from the lecturer on research design, covering key aspects such as formulating a research question, developing a theoretical argument, deriving testable hypotheses, and measuring concepts. The second block will focus on statistics, with input from the lecturer and practical guidance on implementing research design concepts and testing them using the statistical software STATA. Additionally, this block includes STATA exercises that provide students with hands-on experience with data management and statistical analysis to conduct their own analyses and interpret the results.

Resources

- Kellstedt, P.M. and Whitten, G.D., 2018. The fundamentals of political science research. Cambridge University Press.
- Acock, A.C., 2008. A gentle introduction to Stata. Stata press.

Readings marked with an asterisk **(*)** are **required** for the respective class. They should be completed prior to the respective session.

Course Objective

By the end of this course students will learn:

- How to come up with a research question
- How to build good theories and derive clear observable expectations
- How to come up with a research design
- How to manage and analyze empirical quantitative data
- How to interpret results produced by regression models
- How to read quantitative political science
- Get an introduction to the statistical program STATA

Final Grade

- Take-home exam (100%): The final grade consists of a take-home exam that should be submitted by **11 August 2025**. Please note that late **submissions are not permitted** and will result in failure of the course. The only exception is officially de-registering from the exam with a medical certificate. The take-home exam is to be completed **independently**. This is not a group assignment.

Important Dates

11 August 2025 ……. Take-home exam deadline

Expectations

- Attendance: You are expected to attend the weekly sessions. Reading assignments are given by date and should be completed prior to the respective class. You are strongly encouraged to offer suggestions and email material to me to circulate in class.
- Participation: Handle all your coursework diligently. Invest time to actively participate in class, pay attention to the practical exercises. Ensure that all assignments are submitted on time. Please be respectful to each other. All cell phones are to be turned off or silenced during class.
- Accommodation: Reasonable accommodations are available for students with a documented disability. Please let me know if you have a documented disability, so I can provide the accommodations you may need.
- Course schedule: The schedule and readings are subject to change. All changes will be announced by email and updated on MyStudy in advance. It is your responsibility to keep up with the current changes.

Course Plan

Block I: Scientific Study of Politics

Session 1 (07.04.2025): Scientific study of politics
What is the role of quantitative methods in political science? Why is data literacy important?

Session 2 (14.04.2025, ONLINE): Research question and theory
How can we formulate a research question? How can we derive a causal and directional hypothesis? What is causality?

- *Chapter 1 Kellstedt &Whitten
- Chapter 3 Kellstedt &Whitten

Session 3 (21.04.2025): No class – Easter Monday

Session 4 (28.04.2025): Research design and measurement
What is the difference between an experimental and observational research design? How can we measure concepts in different types of variables?

- *Chapter 4 Kellstedt &Whitten
- Chapter 5 Kellstedt &Whitten

Block II: Empirically Analyzing Politics

Session 5 (05.05.2025): Getting started with STATA
Basic explanation of STATA and introduction to the GESIS 2021 election data

- *Chapter 1 Acock
- Chapter 4 Acock
- GLES (2023): GLES Cross-Section 2021, Post-Election. GESIS, Cologne. ZA7701 Datafile Version 2.1.0, doi:10.4232/1.14169 (Codebook)

Session 6 (12.05.2025): Data management I

Why are we interested in descriptive statistics? Do we provide the same descriptive statistics for all different variable types? How can we produce descriptives using STATA?

- *Chapter 5 Kellstedt &Whitten
- Chapter 5 Acock

Session 7 (19.05.2025): Data management II

How can we generate and replace variables in STATA? How can we drop observations from a dataset?

- *Chapter 3 Acock

Session 8 (26.05.2025): Repetition and exercises

Session 9 (02.06.2025): Bivariate hypothesis testing I

Why is a tabular analysis informative? What is a difference in means? What is correlation? How can these tests allow us to test a hypothesis?

- *Chapter 8 Kellstedt &Whitten
- Chapter 6.3, 7.8, and 8.5 Acock

Session 10 (09.06.2025): No class – Pentecost

Session 11 (16.06.2025): Bivariate hypothesis testing II

What is an OLS regression? How can we run it in STATA? How do we interpret the regression output?

- *Chapter 9 Kellstedt &Whitten
- Chapter 8.6 Acock

Session 12 (23.06.2025): Multivariate hypothesis testing

What is the difference between a bivariate and multivariate OLS? How can we run a multivariate OLS in STATA? How do we interpret the regression output?

- *Chapter 10 Kellstedt &Whitten
- Chapter 10.1 – 10.3 Acock

Session 13 (30.06.2025): Diagnostics

Is the OLS regression the appropriate model? Why and how do we check if our model is appropriate?

- *Chapter 11.4 and 10.5 Kellstedt &Whitten
- Chapter 10.7 Acock

Session 14 (07.07.2025): Repetition and exercises