

Quantitative Methods - Syllabus

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1 Course description

In this course students will learn how to use and interpret regression-based methods for the study of politics and international affairs. After the course, the students should be able to be informed, and critical readers of quantitative research done in the field, and should also be able to design research projects and conduct analyses using linear and non-linear regression models.

2 Contents

1. Introduction
2. Refresher of basic concepts in statistical inference: Confidence intervals, hypothesis testing and statistical significance
3. Introduction to linear regression: Adjusting a line via OLS. Intercept and regression coefficient. R squared. Residuals.
4. Inference in linear regression: Statistical inference in regression: Standard Errors and statistical significance (p-values and confidence intervals).
5. Problems in linear regression: Assumptions and diagnostics.
6. Multivariate regression. Introduction to model building. The logics of statistical control.
7. Categorical variables in regression. Interactions
8. Advanced modeling
9. From correlation to causation: challenges and strategies for identification of causal effects (I)
10. From correlation to causation: challenges and strategies for identification of causal effects (II)

3 Methodology

- During the sessions we will combine lectures on the background concepts with in-class activities based on the active learning methods.
- Throughout the semester, students will work in small learning groups composed of 3 randomly assigned students.
- These small groups will be in place for the in-class activities as well as the assignments.
- We will make use of the MS Excel capabilities for data analysis, so students should bring their laptops with the software installed.

4 Evaluation

Evaluation of students' performance will be based on a combination of in-class activities (20%), assignments to prepare at home (30%) and an individual, final exam (50%).

Table 1: Evaluation

Task	%
In-class participation and activities	20
Data analysis assignments (3)	30
Final exam	50

- The analysis assignments will consist on exercises similar to the ones done in class. They will be distributed at the end of the session and expected for the following session. I will distribute 3 assignments.
- The final exam will be similar to the assignments, but meant to be responded individually, and without the use of any supporting software.

5 Handbooks

- Philip H. Pollock 2005. *The Essentials of Political Analysis*. Congressional Quarterly, Inc.
- Andrew Gelman and Jennifer Hill 2007. *Data Analysis Using Regression and Multilevel/Hierarchical Models*. Cambridge: Cambridge University Press
- Kellstedt, P.M. and Whitten, G.D., 2013. *The Fundamentals of Political Science Research*. Cambridge: Cambridge University Press.