UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Quantitative Social Research Methods

2627-118R-QuantSRM

Aims

Knowledge and understanding: the course provides an overview of the methods of quantitative data collection and analysis most commonly used in social science research.

Applying knowledge and understanding: provide the skills needed to design a survey and to analyze cross-sectional, repeated cross-sectional, and longitudinal (panel) data in order to address associative, predictive, and causal research questions.

Making judgments: develop the ability to critically evaluate quantitative methods and results in sociological research, recognizing their theoretical assumptions, limitations, and practical implications.

Communication skills: foster the ability to structure and effectively present quantitative findings within a sociological theoretical framework.

Learning skills: promote autonomy in study and research by encouraging the capacity to deepen course content critically and independently.

Contents

The course provides an integrated overview of the main quantitative methods used in social research. After an introduction to basic econometrics—covering linear regression techniques, the analysis of limited dependent variables, the use of instrumental variables, and the foundations of statistical inference—the course explores the theory and application of multilevel regression for the analysis of comparative and longitudinal data. In the final part, selected topics in survey methodology are examined in greater depth, with the aim of equipping students with the skills needed to design, collect, and analyze quantitative data independently and critically.

Detailed program

The course is structured into three progressive modules that guide students from the fundamentals of econometric analysis to the mastery of advanced techniques for analyzing complex data and designing empirical surveys.
The first module, consisting of seven two-hour lectures, provides a systematic introduction to basic econometrics. Starting from the foundations of linear regression, it addresses key issues related to model estimation and interpretation, such as multicollinearity, heteroskedasticity, and autocorrelation. The module then covers models for limited dependent variables (logit, probit, tobit), useful for studying discrete or censored phenomena, and introduces instrumental variable regression techniques for dealing with endogeneity. It concludes with a discussion of the foundations of statistical inference and the interpretative implications of quantitative results.
The second module, composed of three three-hour lectures, focuses on the theory and application of multilevel regression models. Beginning with the recognition of the hierarchical structure of social data (e.g., individuals nested within families, schools, or countries), it illustrates the logic of estimation and interpretation of two- and multi-level models. Particular attention is given to applications in comparative and longitudinal analyses, where observations are grouped by territorial or temporal units.
The third module, also comprising three three-hour lectures, explores selected topics in survey methodology. It examines questionnaire design principles, sampling techniques, response rate management, and strategies for minimizing survey bias. The module also includes an applied component focused on assessing data quality and documenting research datasets.
Upon completion of the course, students will be able to understand, design, and conduct quantitative analyses of social data, selecting the most appropriate techniques for their research objectives and critically interpreting the results obtained.

Prerequisites

Prerequisites for the course include knowledge of linear regression models and a basic theoretical and methodological background in social research.

Teaching form

The course consists of a total of 48 hours of in-person teaching, organized into lectures that combine expository sessions with interactive activities. Each meeting includes a first part devoted to the presentation of theoretical and methodological content (lecture-based format) and a second part aimed at fostering active student participation through individual or group exercises, presentations, and collective discussions. The course is taught in English, and the practical sessions will be conducted using the statistical software Stata.

Textbook and teaching resource

Angrist, J. D., & Pischke, J.-S. (2009). Mostly harmless econometrics: An empiricist’s companion. Princeton, NJ: Princeton University Press.

Angrist, J. D., & Pischke, J.-S. (2015). Mastering ’metrics: The path from cause to effect. Princeton, NJ: Princeton University Press.

Cameron, A. C., & Trivedi, P. K. (2010). Microeconometrics using Stata. College Station, TX: Stata Press.

De Leeuw, E. D., Hox, J. J., & Dillman, D. A. (2008). The cornerstones of survey methodology. In E. D. de Leeuw, J. J. Hox, & D. A. Dillman (Eds.), International handbook of survey methodology (pp. 1–17). New York, NY: Lawrence Erlbaum Associates.

Groves, R. M., Fowler, F. J., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009). Survey methodology (2nd ed.). Hoboken, NJ: Wiley.

Huff, D. (1993). How to lie with statistics. New York, NY: W. W. Norton & Company.

Kreft, I. G. G., & de Leeuw, J. (1998). Introducing multilevel modeling. Thousand Oaks, CA: Sage.

Longhi, S., & Nandi, A. (2015). A practical guide to using panel data. Thousand Oaks, CA: Sage.

Rabe-Hesketh, S., & Skrondal, A. (2005). Multilevel and longitudinal modeling using Stata. College Station, TX: Stata Press.

Sala, E., Knies, G., & Burton, J. (2014). Propensity to consent to data linkage: Experimental evidence on the role of three survey design features in a UK longitudinal panel. International Journal of Social Research Methodology, 17(5), 455–473.

Sala, E., & Lillini, R. (2017). Undercoverage bias in telephone surveys in Europe: The Italian case. International Journal of Public Opinion Research, 29(1), 133–156.

Singer, J. D., & Willett, J. B. (2003). Applied longitudinal data analysis: Modeling change and event occurrence. Oxford: Oxford University Press.

Weiss, N. A. (2012). Introductory statistics (9th ed.). Boston, MA: Addison-Wesley.

Wooldridge, J. M. (2013). Introductory econometrics: A modern approach (5th ed.). Mason, OH: South-Western Cengage Learning.

Semester

february 2027 - may 2027

Assessment method

The final course grade (i.e., the overall mark) is calculated according to the following percentages:

30% of the grade is based on class participation — including active attendance, contributions to discussions, and engagement in exercises and other classroom activities;

70% of the grade is based on homework assignments completed during the course, which constitute the main component of the overall evaluation.

Office hours

Wednesday (11.00-12.00)

Sustainable Development Goals

QUALITY EDUCATION