UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Laboratory of Quantity Methods - C

2627-1-F5112P008-F5112P008002-C

Learning area

Experiential learning

Learning objectives

Knowledge and understanding

- Identifying the correct analysis to be performed among Principal Component Analysis, Regression, and Analysis of Variance to test a hypothesis.
- Identifying the variables to run the analysis

Applying knowledge and understanding

- Running Principal Component Analysis, Regression, and Analysis of Variance in
- Interpreting Results

Making Judgements

- Students will be encouraged to critically evaluate methodological choices, independently identifying the most appropriate techniques for specific theoretical questions and research contexts, with attention to the conceptual implications of analytical decisions.
  Communication Skills

Communication Skills

- Students will learn to clearly and effectively communicate the rationale behind analytical choices and to present the results obtained, appropriately articulating statistical inferences using technically accurate yet

accessible language.

Learning Skills

- Through practical use of the JAMOVI software and both individual and collaborative work, students will develop competencies that can be independently applied in future academic and professional settings, fostering continuous and self-directed learning.

Contents

We will use the *jamovi* statistical package to perform Principal Component Analysis on questionnaire data, Regression Analysis, and simple Analysis of Variance for experimental data. During the laboratories, students will learn how to perform these statistical techniques on different datasets and how to interpret the results.

Detailed program

- Brief Introduction to *jamovi*
- Linear Regression (simple, multiple including mediation and moderation analyses)
- Analysis of Variance (between-subject, within-subject)
- Principal Component Analysis

Prerequisites

Students should have basic knowledge of statistical software (such as SPSS or *jamovi*) to be able to perform basic operations (e.g., data entry, creation of variables, etc.). Furthermore, they should be attending or have attended the Quantitative Methodologies course, because it provides theoretical knowledge regarding the statistical techniques used.

Teaching methods

The module comprises 24 hours of interactive exercises (Didattica Interattiva, DI), organised into three-hour sessions held entirely in person. Each session includes the presentation of analysis examples and the individual completion of similar exercises by the students under the lecturer’s supervision. No remote teaching activities are planned. The module will be held in Italian.

Assessment methods

No summative interim assessments are planned. During the sessions, students will complete formative exercises on the three main topics covered: Principal Component Analysis, linear regression, and Analysis of Variance.

Successful completion of the module requires attendance of at least 70% of the scheduled hours and passing a final assessment, which will be held during the last session.

The final assessment will be individual and will consist of a written test held in person during the last session of the module. The test will include applied statistical-analysis exercises to be completed using jamovi. The assessment will evaluate the students' ability to identify the appropriate statistical technique according to the research question and the available variables, accurately perform the analyses, and correctly interpret the results. The final assessment is passed when the answers demonstrate an overall adequate ability to apply the techniques covered and interpret the results.

Textbooks and Reading Materials

Gallucci, M., Leone, L., & Berlingeri, M. (2017). Modelli statistici per le scienze sociali. Pearson

Danielle J. Navarro and David R. Foxcroft, Learning Statistics with jamovi: A Tutorial for Beginners in Statistical Analysis. Cambridge, UK: Open Book Publishers, 2025, https://doi.org/10.11647/OBP.0333

Sustainable Development Goals

QUALITY EDUCATION