UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Psychometrics With Software Lab 2 - 1

2627-2-E2403P010-T1

Learning area

Methods, techniques and instruments for psychology research; statistics and quantitative methods

Learning objectives

Knowledge and understanding
• Statistics for correlation data
• Statistics for experimental data
• Simple and complex relationships among different types of variables
• Basics of measurement in psychology

Applying knowledge and understanding
• Ability to analyze data collected in different research designs
• Estimating and understanding simple and relationships among variables.
• Employing and evaluating different types of psychological measures
• Use of statistical software

Independent Judgment

- Understand and evaluate the quality of statistical analyses presented in the literature
- Critically assess and use different types of psychological measures

Communication Skills

- Write statistical results from empirical research in a clear and logical manner
- Understand and apply APA communication guidelines

Learning Skills

- Understand data-based conclusions encountered in other courses
- Understand the statistical analyses presented in the studies reviewed during thesis preparation

Contents

The course provides an overview of several statistical techniques and methodological concepts, useful to collect and analyze data in a wide range of research situations. Univariate statistical techniques are presented, with emphasis on the interpretation of results. Fundamental concepts related with measurement in psychology are also discussed.

Detailed program

Lectures:

- Introduction to measurement
- Introduction to statistical modelling
- Multiple regression
- Mediation
- ANOVA and general linear model
- Assumptions of the general linear model
- Non-parametric tests
- Factor Analysis
- Validity and reliability of a measure

Lab:

- Introduction to the statistical software Jamovi
- Pratical experience with statistical techniques

Prerequisites

Basics of descriptive statistics (measures of central tendency and dispersion) and inferential statistics

Teaching methods

Lectures:
21 2-hour lectures conducted in the delivery mode in the initial part and interactively in the subsequent part. The delivery mode is aimed at addressing the theoretical foundations of the statistical techniques in the program, their applicability and their interpretation, with examples from the psychological literature. The interactive mode is aimed at discussing data analysis.

Lab:
9 2-hour laboratory activity conducted in the interactive mode. Practice sections in the computer labs are dedicated to analyse real data and discuss their results.

All activities are conducted in presence.

Assessment methods

Written final test with multiple-choice questions and open-end questions including problems. The oral exam is optional.

- *Multiple-choice questions*: multiple-choice questions twill assess particularly the understanding of the theoretical models underlying psychometric measurement and data analysis techniques.
- *Open-ended questions*: open-ended questions will assess the ability to apply this knowledge for developing research projects and for analyzing data. The student will be assessed on their ability to understand a research design, select useful statistical techniques to answer the research question, execute them with the statistical software, interpret and report the results following international standard (APA)
- *Oral exam*: the possibility of an oral exam is offered to students who consider that the result of the written exam does not reflect their real competence. The oral exam will include both the discussion of the written exam and a discussion of the topics covered in class. During the oral exam, both theoretical knowledge and practical abilities related to data-analysis will be assessed.

The final grade takes into account the overall score obtained in the various sections of the exam, according to the following scale:

- 18: barely sufficient knowledge, minimal ability to apply and interpret concepts;
- 19–22: sufficient knowledge of fundamental concepts, with some uncertainty in application and interpretation;
- 23–26: fair knowledge, good ability to apply concepts and interpret analyses with some inaccuracies;
- 27–30: solid knowledge, good command of the content and the statistical techniques, and critical thinking skills;
- 30 with honors: fully adequate knowledge, complete mastery, excellent analysis, and outstanding command of language.

There will be no midterm exams.

Textbooks and Reading Materials

The teaching material includes lecture slides and the textbook. I will also suggest scientific papers about specific topics. The lecture slides and the papers will be made available on the university's onilne platform.

Textbook: Gallucci M., Leone L., Berlingeri, E. (2017). Modelli statistici per le scienze sociali, seconda edizione. Milano: Pearson Educational.
The text is freely available, also as an e-book, at the University library (follow the instructions at https://www.biblio.unimib.it/it).

Sustainable Development Goals

QUALITY EDUCATION