UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Elements of Psychometrics With Software Lab 1

2324-1-E2401P131

Learning area

4: Knowledge of qualitative and quantitative research methodology

Learning objectives

Knowledge and understanding

- Descriptive statistics
- Inferential statistics
- Univariate and bivariate statistical inference

Applying knowledge and understanding

- Using SPSS (or another statistical software) for data analysis
- Ability to choose the most adequate data analysis technique for the context
- How to report results of statistical analyses in conformity to the prevailing standards in psychology.

Contents

The course aims at providing the basic knowledge of descriptive and inferential statistics. Furthermore, it addresses some techniques of statistical analysis and introduces the use of the SPSS (or of another statistical software).

Detailed program

- Descriptive statistics: measurement scales, central tendency and variability indices, standardized measures;
- Graphical synthesis and graphical exploration of the data;
- Introduction to probability;
- Basic inferential statistics: sampling distribution, hypothesis testing, confidence intervals;
- Parametric techniques: t-test for the difference between means (single sample, independent samples, paired-samples); linear correlation (Pearson's)
- Non-parametric techniques: Chi-squared test (equally-probable categories, independence, test of a model), correlation (Spearman)
- Effect size and its use
- Introduction to the concepts of power analysis

Prerequisites

As this is a compulsory first-year course, the only prerequisites are basic knowledge of mathematics/algebra and of computer use.

Possible specific lacunae will be handled during the lessons.

Teaching methods

Lectures in Italian, mostly split into blocks corresponding to the chapters of the coursebook. The statistical software will be discussed within the blocks, through exercises in class. Self-evaluation exercises may be available for some blocks (on the e-learning platform).

In parallel to the lectures, "software laboratories" will be available, during which students will use the statistical software(s) to enhance their learning.

Assessment methods

The exam is in written form and consists of exercises of statistical analysis, open questions and, multiple-choice questions. SPSS (or another statistical software) will be used with a data file provided at the beginning of the examination.

The questions aim to ascertain the active acquisition of the theoretical knowledge and of the ability to execute statistical analyses (with and without statistical software) and understand the results.

There will be no partial or in itinere exams.

Interested students can also request an oral supplement, on all topics of the course. This oral integration can increase or decrease the mark of the written exam up to 2 thirtieths.

Textbooks and Reading Materials

For lessons (theory):

- Slides (in Italian)
- Aron, A., Coups, E. J., & Aron, E. J. (2018). *Fondamenti di statistica. Introduzione alla ricerca in psicologia.* Milano: Pearson. [capp. 1 a 8, 9 parziale, 11, 13, 14]

For the practical part, a text chosen from:

- Vanin, L. (2014). *SPSS pratico. Configurazioni, output e interpretazioni a colpo d'occhio*. Milano: Cortina.
- Barbaranelli, C., D'Olimpo, F. (2007). *Analisi dei dati con SPSS. Vol. I: Le analisi di base*. Milano: LED.
- Any book (in English) on SPSS (versions from 16 onwards) as long as it includes the course topics (available in the University Library).

Sustainable Development Goals