UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Data Analysis I

2021-3-E3301M213

Learning objectives

The goal is to provide students with the practical and operational skills, referring measurements, detection and treatment of the relevant data to the economic analysis in its various application aspects. The course offers students a solid foundation in some of the most important, broadly used, statistical models, as well as some experience in applying those methods to a broad range of real economic problems. The student will learn how to interpret results and will develop his own point of view in reading tables and graphs, even made by a third part, related to economic studies. Furthermore, students will get a solid foundation in some of the most important statistical methods, a good experience in applying those methods to data and interpreting results. Students will be able, therefore, to use the knowledge gained in the course to analyze the opportunities and critical issues of the environment in which they work by elaborating collection and data analysis.

Contents

The objective of data analysis is to extract the relevant information contained in the data which can then used to solve a given problem. The course provides a number of multivariate statistical techniques to obtain relevant information from data.

Detailed program

Classification methods of multivariate analysis

Methods of dependence and interdependence, contingency table, variance and covariance matrix, correlation matrix; standardized data matrix, variances and covariances matrix between standardized data.

Cluster Analysis

Hierarchical methods of aggregation, non-hierarchical methods.

Principal component analysis

Criteria for selecting the number of principal components, interpretation of the principal components, graphical representation of the results.

Linear Discriminant Analysis

Discriminant scores, criteria for selecting the number of discriminant functions, classification of the statistical units.

Prerequisites

An introductory course of descriptive Statistics; Probability and main random variables.

Teaching methods

Frontal lessons (theory and examples).

In the case of Covid-19 emergency, lessons (theory and examples) will take place remotely and asynchronously, with additional synchronous videoconferencing events.

Assessment methods

The exam consists of questions about theory and exercises. The former test students' knowledge and understanding of the main concepts of the subject. The latter measure students' ability in the application of such concepts to solve simple practical problems. Students with a grade of at least 18/30 in the test can ask for a supplementary oral, which may raise or lower the former mark. Before the oral, graded tests are shown and students can ask for details about corrections and criteria used to grade. The oral is optional, but the teacher can make it mandatory in his judgment.

Textbooks and Reading Materials

F. Delvecchio, Analisi statistica di dati multidimensionali, Cacucci, Bari, 1992;

A. Rizzi, Analisi dei dati, NIS, Roma, 1990;

S. Sharma, Applied Multivariate Techniques, John Wiley & Sons, 1985;

O. Vitali, Statistica per le scienze applicate, Cacucci, Bari, 1999;

S. Zani, Analisi dei dati statistici II, Giuffré, Milano, 2000.

Semester

First semester.

Teaching language

Italian.