UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

## Statistics I - 1

**2021-1-E1801M039-T1**

### Learning objectives

Economic disciplines study a variety of phenomena often showing  different features.

This course provides the main statistical methods to collect, represent, synthetize and analyze data for such phenomena.

Students will learn how to select and apply the suitable statistical method to describe single phenomena and/or to interpret their relations.

### Contents

The course provides the main tools for synthetizing the main features of statistical data and for analyzing the relations between them.

**The meaning of Statistics**: Statistics as a science, Applications of Statistics, The branches of Statistics.

**Summarizing univariate data**: Data collection, Ratios of statistical data, Frequency distributions and graphical displays, Central tendency measures, Variability measures, Concentration measures.

**Summarizing bivariate data**: Bivariate and partial frequency distributions, Independence and association measures, Mean independence and mean dependence measures, Main interpolation methods, The least squares method, The least square line and its properties, The regression function and the regression line, Concordance and correlation measures.

## Detailed program

**Introduction**

The meaning of Statistics
The science of Statistics Statistical applications
The branches of Statistics

**Descriptive Statistics for Univariate data**

Data collection
Statistical ratios
Frequency distributions and graphical representations
Central tendency measures
Variability measures
Concentration measures

**Descriptive Statistics for bivariate data**

Bivariate frequency distributions
Independence and association measures

Interpolation methods: the least squares method, the least squares line and its properties

The regression function and the least square regression line

Concordance and correlation measures

## Prerequisites

In this course the use of concepts of mathematical analysis, such as derivative and integral, is not requested.

## Teaching methods

Teaching method depends on the evolution of the COVID-19 pandemic.

A traditional method (lectures and practical sessions) will be used if the pandemic will be under control.

Otherwise, the lectures and the practical sessions will be recorded and uploaded on the e-learning platform.

## Assessment methods

The exam is written and oral. The written test consists of open questions about theory and numerical exercises. The theoretical questions tests students' knowledge and understanding of the main concepts of the subject. The

exercises measures students' ability in the application of such concepts to solve simple practical problems. Students with at least 18/30 in the written test are admitted to oral exam. The oral exam is a discussion about the written test and about subjets/indicators of the programm. In the global evaluation will be also considered the ability to comment the practical problems and to express the concepts with an appropriate language.

If the the pandemic from COVID-19 permits, the examination will be carried out in the presence. Otherwise, the written exam will be performed remotely using a proctoring platform (Proctorio or Respondus), the oral discussion will be carried out by using the WebEx platform.

## Textbooks and Reading Materials

M. Zenga "Lezioni di statistica descrittiva", Ed. Giappichelli, 2014

M. Zenga "Esercizi di statistica", Ed. Giappichelli, 1993

M. Zenga "Richiami di matematica", Ed. Giappichelli, 1992

D. Piccolo, "Statistica per le decisioni", Ed. Il Mulino, 2004

G. Leti "Statistica descrittiva", Ed. Il Mulino, 1983

G. Cicchitelli, P. D'Urso, M. Minozzo "Statistica: Principi e Metodi", Pearson, 2017

## Semester

## Teaching language

Italian