UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Statistics

1920-2-E4001N085

Learning objectives

The course is mainly methodological and aims at the following purposes:

a) to introduce students to statistical reasoning and basic statistical tools

b) to introduce the basics of both univariate and bivariate Descriptive Statistics; to introduce the basics of Statistical Inference; to unify and formally collocate methods and techniques of data analysis which the students might have already met in previous school/university courses; to provide new statistical tools with both descriptive and inferential purposes.

Contents

The course offers an introduction to the formal principles of the modern statistical reasoning, from the basics of descriptive statistics to the basic instruments of statistical inference.

Applications are covered through exercise classes supplementing the main theoretical course.

Detailed program

- Basics of univariate Descriptive Stats: statistical population & unit, statistical variable and its values; (complete) data collection, frequency distributions; mean values and measure of variability.

- Basics of bivariate Descriptive Stats: joint (complete) data collection of a pair of statistical variables and two-way table; independence; concept and measure of (global) association, dependence and (linear) correlation; introduction to regression and linear (bi-variate) model.

- Basics of Statistical Inference: sampling, sample variability and sampling error; essential elements of probability; point estimate and estimators for the population mean and percentage (relative frequency); estimator's properties, Mean Squared Error and Standard Error; Confidence Interval for the population mean and percentage (relative frequency), exact for Normal population and approximated for Large Sample; (Significance) Test Z and T for null hypotheses on the population mean and percentage (relative frequency), Independence Chi Square Test for contingency table.

At the time of ending of classes (Dec 2019) the detailed program (with references to the textbook) will be available on line. It will remain valid for all the exams of the academic year 2019/20

Prerequisites

Credits from Mathematics for Social Sciences (1st year) are strongly suggested.

Sets and their cardinality (finite, countable and uncountable); real intervals; simple linear parametric equations; (real) function and its values; polynomials and the slope-intercept line; minimum of a real function.

Teaching methods

Theory lessons and exercise classes

Additional material and forum online http://elearning.unimib.it, including slides of all classes (theory and exercises) and written tests of the previous academic year.

Assessment methods

Written Tests with both numerical exercises and theoretical questions

A tentative score is provided for each question/exercise (on a scale 1-30, for a correct and complete answer)

Duration of the written test: 2 hours. Withdrawal allowed anytime.

Oral test provided on demand and upon a positive score in the written test.

Textbooks and Reading Materials

In Italian

F. Mecatti, "Statistica di Base. Come, quando e perché". McGraw-Hill, II ed. (2015);

L. Pagani, "Complementi ed esercizi di statistica descrittiva ed inferenziale " Amon (2015);

English textbooks are suggested on demand and/or according to specific needs.