UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Statistics

2122-1-E1601N063

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.

During the course online tools are offered for self-practice and intermediate partial quitz that are valid for the final exam.

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 (May 2022) 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 with video-recording made available on-line

Additional material and forum online http://elearning.unimib.it, including slides of all classes (theory and exercises)

Additional online didactic activities

Weekly Tests http://elearning.unimib.it: additional exercises online, as multiple-choices Quiz, to be carried out autonomously and optionally.

Intermediate Assessments online http://elearning.unimib.it as time-based multiple-choice Quiz, to be carried out autonomously and optionally for anyone enrolled on the elearning page. The Intermediate Assessments can be used to : 1) prepare for the written exam (online and / or in presence); 2) under conditions that will be published on the elearning page at the beginning of the course (March 2022), replace the written exam and access to a simplified online exam consisting of open theoretical questions

Assessment methods

Written Test, online, with both numerical exercises (multiple choice) and theoretical (open) questions

Duration of the written test: 1h 30m Withdrawal allowed anytime.

Optional 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);

Additional digital tools and materials at http://elearning.unimib.it (see previous section Teaching methods**)**

English textbooks and additional digital resources will be advised on demand and/or according to specific needs