UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Statistics II

2627-2-E4103B011

Learning objectives

At the end of the course students are expected to 1) apply correctly a variety of inferential statistical techniques both to estimate the parameters of the distribution of a random variable and to test statistical hypotheses, 2) interpret, in plain language, the application and outcomes of these techniques, 3) they should also be able to plan a sample according to some commonly used sampling designs.

The course contributes to consolidating knowledge and understanding in the field of inferential statistics, in line with the "Statistics" learning area of the Bachelor's degree program in Statistical and Economic Sciences.

Contents

Statistical inference: point estimation, confidence interval and tests of statistical hypotheses. Finite population sampling and inference.

Detailed program

The course is composed of two modules.

Module 1. Statistical inference. Point estimate. Estimation methods and their properties. Maximum likelihood and method of moments. Confidence intervals.

Module 2. Statistical tests. Z, t, chi-squared and F tests. P-values. Error probabilities and the power function. Most powerful tests. Neyman-Pearson lemma. Likelihood ratio tests. Finite population sampling and inference. Sampling designs. Sample size calculation.

Prerequisites

Prerequisites are Probability, Statistics I and Calculus I.

Teaching methods

Class lectures and exercise sessions.

Assessment methods

Students are supposed to pass a written and an oral exminaton.

The overall mark is obtained by averaging the marks obtained in each part.

The written examination can be replaced by two ad interim assessments that take place at the end of each module of the course (see the Semester section below).

Textbooks and Reading Materials

Cicchitelli, G, D'Urso, P, Minozzo, M. 2021. Statistics: Principles and Methods, Pearson Italia, Milano-Torino website: https://he.pearson.it/bundle/497

Further material will be circulated via the e-learning web page of the course.

Semester

The course is scheduled in the first semester and is divided into two parts each lasting seven weeks.

Teaching language

Italian

Sustainable Development Goals

QUALITY EDUCATION