UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Statistical Inference

2122-3-E3301M212

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. 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

This course provides a basic understanding of the uses of statistical inference. Particular attention is devoted to problems of estimation and to hypothesis testing that frequently occur in economic applications and in social sciences.

Detailed program

Sample distribution

Simple random sample; statistics and sample moments; Cebicef's inequality; the weak law of large numbers; the central limit theorem; the joint distribution of the sample mean and sample variance in samples from normal distributions; the Chi squared, Student's t and Fisher's F distributions.

Parametric Inference

Method of moments and maximum likelihood estimation; Rao Cramer's lower bound; exponential families; confidence intervals.

Hypothesis testing

Tests for the mean and variance of normal distributions.

The Chi-square test.

Tests for two independent samples.

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

M. ZENGA, Inferenza statistica, Giappichelli, Torino 1996

Semester

First semester.

Teaching language

Italian.