UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

# Techniques of Quantitative Data Analysis

**2223-2-E4001N083**

### Learning objectives

The course aims at offering a systematic introduction to the quantitative analysis of social phenomena, defined as the empirical analysis of phenomena regarding the functioning of human societies, based on the scientific method and the use of mathematical tools.

### Contents

The course offers a systematic introduction to the quantitative analysis of social phenomena.

### Detailed program

The aim of the course is to offer a systematic introduction to the logic and practice of quantitative analysis of social phenomena, understood as the empirical analysis of phenomena concerning the functioning of human societies, based on the scientific method and the use of mathematical tools. The course opens with an introduction to critical reasoning, the scientific method and quantitative reasoning, understood as fundamental prerequisites of rigorous and accurate analysis of social phenomena. Next, the course illustrates the main elementary techniques of quantitative data analysis, focusing on their underlying logic and meaning in the context of social research practice. There are three general topics covered in this area: the representation and analysis of distributions of qualitative and quantitative variables; the analysis of association between pairs of variables; and the elementary principles of causal analysis. Some of the topics covered in the course are also covered in the *Statistics* course. These topics, however, are discussed in different ways in the two courses; in particular, this course favors an applied sociological perspective, with examples and references--including theoretical ones--regarding various types of social phenomena.

**Prerequisites**

Enrolling students are requested to possess the basic notions of mathematics and methodology of the social sciences.

**Teaching methods**

Standard lectures with in-class exercises.

**Assessment methods**

The examination can be carried out in two ways.

Mode 1: Taking a written test consisting of answering twenty questions (eighteen multiple-choice and two open questions) on subjects taken from the teaching materials. Answers to multiple-choice questions will be scored 1.5 if correct, 0 points if incorrect; answers to open-ended questions will be scored 0-3. The test grade will be equal to the sum of the points obtained in all the questions, rounded up (first decimal equal to or greater than 5) or down (first decimal less than 5) to the nearest whole number; rounded sums equal to 31 will be equated to grade 30/30, while those equal to 32 or 33 will be equated to grade 30 cum laude. The time available for the test is 40 minutes.

Mode 2: Writing and discussion of a short paper aimed at answering a research question by applying a quantitative approach and using the Stata and/or R software. The content of the paper must be agreed with the instructor at least two months before the examination date. The final paper must be sent to the instructor at least one month before the examination date. Further information on how to write and discuss the paper will be published on the e-learning page of the course. Please note that the course does not offer systematic training in the use of the Stata and R software; the acquisition of a working knowledge of this software, therefore, is entirely the responsibility of the students and is an integral part of the examination.

**Textbooks and Reading Materials**

To prepare for the exam, students in the course should study and assimilate in full the contents of all teaching materials, which include:

a) A book on critical reasoning and the scientific method: Polidoro M., *Pensa come un? scienziat?. Come coltivare l'arte del dubbio*, Milano, PIEMME, 2021.

b) A book on quantitative data analysis: Corbetta P., Gasperoni G. and Pisati M., *Statistica per la ricerca sociale*, Bologna, il Mulino, 2001, chapters 1-7.

c) Other materials: additional examination materials (texts or videos) may be used, which, if necessary, will be made available on the e-learning page of the course in the Learning Materials section.

**Sustainable Development Goals**

QUALITY EDUCATION