



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Construction of Socio-Economic Scenarios

2526-1-F6303M003-F6303M003-2

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#### Learning objectives

The course provides students with a core set of statistical and econometric tools for social science applied research.

#### KNOWLEDGE AND UNDERSTANDING

By the end of the course, students should be able to:

- identify and understand the knowledge questions that lead to the construction of socio-economic scenarios, with particular attention to research and evaluation questions;
- recognize and understand which statistical or econometric methodology is most appropriate to address the knowledge question posed, given the available data;
- understand the differences between various statistical and econometric methods;
- assess whether a methodology is correctly applied to the available data;
- interpret and critically understand the results obtained.

#### APPLYING KNOWLEDGE AND UNDERSTANDING

By the end of the course, students should be able to:

- define and formulate knowledge questions that lead to the construction of socio-economic scenarios, with a specific focus on correctly framing research and evaluation questions;
- design an empirical strategy to address the knowledge question using available data;
- competently apply basic statistical and econometric methods;
  - demonstrate mastery of appropriate methods for the analysis of economic and social data, at both micro and macro levels, including forecasting;
- use a suitable statistical software to analyze data, also with the support of generative AI tools;
- clearly present and comment on the results of the analysis, also with the support of generative AI.

#### MAKING JUDGEMENTS

By the end of the course, students should be able to:

- develop a critical attitude toward the methods and results of empirical analyses;
- independently assess the adequacy of a methodology in relation to the research problem and available data;
- identify possible limitations in the results obtained or in evidence-based decision-making processes.

## COMMUNICATION SKILLS

By the end of the course, students should be able to:

- clearly and rigorously communicate the steps of an empirical analysis, from question formulation to result interpretation;
- present results in written, oral, and visual formats (tables, charts, summary texts);
- use appropriate language, both technical and accessible, depending on the audience (academic, technical, institutional, or general public).

## LEARNING SKILLS

By the end of the course, students should be able to:

- independently update and deepen their methodological and applied knowledge;
- critically use digital resources, manuals, and technical documentation for continuous learning;
- learn how to integrate innovative tools (e.g., generative AI) into the analysis process and in solving complex empirical problems.

## Contents

Topics to be covered:

- Simple statistical tools
- Introduction to linear regression and regressions with binary dependent variable.  
-Introduction to panel data analysis .

## Detailed program

### Topics:

#### 1) Statistical tools:

- collection and organization of information, archives, and tabulations;
- processing of individual data: univariate and bivariate descriptive statistics;
- the representation of statistical relationships, also with the support of generative AI

#### 2) Econometric tools:

- Linear regression with one regressor .
- Linear regression with multiple regressors.
- Regression with binary dependent variable
- Regression with panel data

## **Prerequisites**

Participation to the course requires basic background in statistics.

## **Teaching methods**

- Face-to-face lectures: 50% of the course, 24 hours
- Exercises in lab (exercises, database, software etc.): 50% of the course, 24 hours
- Group and individual assignments

## **Assessment methods**

Students will be graded based on the performance during the course (assignments) and at the final written exam.

## **Textbooks and Reading Materials**

James H. Stock - Mark W. Watson *"Introduzione all'econometria"* 5<sup>th</sup> Ed. • Pearson Ed.

Online video tutorials on Stata (many are available on YouTube).

A detailed reading list will be posted on the course web site

## **Sustainable Development Goals**

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY | DECENT WORK AND ECONOMIC GROWTH | REDUCED INEQUALITIES

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