



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Data Management, Data Exploration, Data Visualization

2627-1-F7703M009-F7703M009-1

Learning objectives

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

- Understand the fundamentals of data management, including data cleaning and organization.
- Gain practical skills in using modern tools and languages such as SQL and Python for data manipulation.
- Explore datasets to identify patterns, anomalies, and meaningful insights through exploratory analysis.
- Effectively communicate analysis results by creating interactive visualizations and dashboards with tools such as Tableau or Power BI.

Contents

- Data Management: data lifecycle, databases, data cleaning, and data quality.
- Data Exploration: descriptive statistics, analysis using Python (or similar tools), and feature engineering.
- Data Visualization: visualization principles, creating charts, and interactive dashboards.

Detailed program

- Data Management (6 hours): Introduction to the data lifecycle, relational and NoSQL databases, data cleaning and preprocessing techniques, and principles of data governance.
- Data Exploration (7 hours): Application of descriptive statistics, exploratory data analysis (EDA) using Python and its libraries (or a similar tool), and feature engineering techniques for creating new variables.
- Data Visualization (8 hours): Introduction to the principles of effective visualization, creating charts and dashboards with Python (e.g., Plotly) and commercial software (Tableau/Power BI), and developing a project.

Prerequisites

Basic knowledge of mathematical logic, including the concepts of sets, propositional logic, graph theory, and set theory for relational models. A basic familiarity with computer science concepts and programming logic is recommended.

Teaching methods

The course consists of a total of 21 hours of instruction, combining theoretical lectures with guided practical exercises for each module.

Assessment methods

The exam consists of a mandatory oral exam (an interview on the topics covered in class). The purpose of the oral exam is to assess students' comprehensive understanding of all the skills acquired during the course and their ability to apply them to a real-world dataset. Active participation in class and the completion of the assigned exercises will also be taken into account.

Textbooks and Reading Materials

Course materials will be provided during the course in the form of slides, publicly available resources, exercises, datasets, and workflows. The materials include the use of specific software.

Semester

Second semester.

Teaching language

Italian.

Sustainable Development Goals

QUALITY EDUCATION

