



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Mathematics

2324-2-E4001N078

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#### Aims

Provide the student with the basic principles of mathematical calculus and discrete probability, so that the quantitative behaviour of social and economic phenomena can be studied and interpreted. Develop logical and analytical skills to solve problems.

#### Contents

Combinatorics. Discrete probability. Matrices. Introduction to graph theory.

#### Detailed program

Sets: subsets, operations and relations between sets.

Combinatorics: sequences with and without repetitions. Permutations. Combinations. Finite probability space. Repeated and independent tests. Dependent and independent events. Conditional probability. Conditional probability and partitions. Bayes theorem.

Elementary functions: polynomials, exponentials, logarithms, their properties and graphs.

Operations with matrices.

Introduction to graph theory: definitions, properties and applications. Simple, complete, bipartite graphs. Path. Map coloring. Eulerian graphs. Handshaking Lemma.

## **Prerequisites**

Elementary algebra. Exponential functions and logarithms. Inequalities.

## **Teaching form**

Classroom lectures at the blackboard

## **Textbook and teaching resource**

information available on the e-learning platform

## **Semester**

First semester

## **Assessment method**

Written exam with the possibility of an oral integration.

The oral exam can be requested by either the teacher or the student.

The written exam consists of closed and/or open-ended questions that cover all the topics discussed in class.

Two partial exams are scheduled during the course.

The exam is considered passed with the partial exams if the average score is equal to or greater than 18, and the score in each exam is equal to or greater than 16. If a score of 16 or higher is achieved in the first partial exam and the average score in the second exam is below 18, the result of the first partial exam will no longer be considered valid.

## **Office hours**

By appointment

## **Sustainable Development Goals**

QUALITY EDUCATION

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