

# UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA

#### **COURSE SYLLABUS**

## **Probability**

2526-1-E4103B004

#### Learning objectives

Introducing to the basic concepts and tools of probability theory needed for statistical inference.

#### **Contents**

Random events and probability measures.

Stochastic independence and conditional probability.

Discrete and continuous random variables.

Limit theorems.

#### **Detailed program**

Views of probability. Random experiments; random events; sample space. Probability measures.

Stochastic independence; conditional probability; Bayes theorem.

Random variables; distribution function; discrete and continuous random variables. Expected value; location and scale parameters.

Special discrete distributions. Special continuous distributions.

Stochastic independence of random variables; sum of independent random variables.
Convergence in distribution and in probability; law of large numbers and central limit theorem.
Prerequisites
Knowledge of the topics covered by "Calculus I" and "Statistics I".
Teaching methods
Twenty-four three-hour class lectures.
Assessment methods
Written and oral exams.
The written exam aims at testing the problem-solving ability while the oral exam aims at evaluating the theoretical skills.
The overall mark is the average of the marks obtained in the two exams.
Examples of questions for the exams are available on the e-learning platform.
Textbooks and Reading Materials
Lecture notes available on the e-learning platform.
Compater
Semester
The course is scheduled in the second semester.
Teaching language
Italian.

Multivariate random variables.

### **Sustainable Development Goals**

QUALITY EDUCATION