



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Statistica Multivariata

2324-1-F8204B002-F8204B003M

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#### Learning objectives

The aim of the course is to introduce some multivariate techniques used in exploratory data analysis and in prediction.

The student will be able to apply the aforementioned techniques to real data collected, for instance, in social and economic fields and that can be characterized by high-dimensionality.

#### Contents

- Exploratory data analysis
- Prediction tools

#### Detailed program

Basic concepts of data visualization

Tools to assess the generalization error: training and test set and K-fold cross validation

Bayes classifier, linear and quadratic discriminant analysis

Classification and regression trees

Ensemble techniques

## **Prerequisites**

Exploratory data analysis, statistical models, probability theory, statistical inference, programming

## **Teaching methods**

Theoretical lectures and computer lab lectures.

## **Assessment methods**

There will just be a final examination.

The exam is written and includes theoretical and practical exercises to be solved with or without the aid of the computer. The exercises have the aim to assess the knowledge and the ability of the student to solve problems by applying the statistical techniques introduced in the course.

## **Textbooks and Reading Materials**

James, G, Witten, D., Hastie, T., Tibshirani, R., An Introduction to Statistical Learning with applications in R, Springer, 2013

Everitt, B., Hothorn, T. An Introduction to Applied Multivariate Analysis with R, Springer, 2011

Hastie, T., Tibshirani, R., Friedman, J. ,The Elements of Statistical Learning, Springer, 2001

Izenman, A.J., Modern Multivariate Statistical Techniques, Springer, 2008

Azzalini, A. Scarpa, B. Analisi dei dati e data mining, Springer, 2009

Dobson, A., Barnett, A., An Introduction to Generalized Linear Models, CRC Press, 2008

## **Semester**

Secondo semestre, first cycle

## **Teaching language**

italian

**Sustainable Development Goals**

QUALITY EDUCATION

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