UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# SYLLABUS DEL CORSO

# Metodi Informatici per la Gestione Aziendale

**2021-3-E3101Q131**

## Aims

The course aims at providing the student with the following professional skills:

- analysis of the main tasks in the organization and management of a company
- reading and interpretation of a company balance sheet
- Machine Learning based techniques for data analytics.
- analysis of specific problems with development of machine learning applications in R.

During the labs, business analytics skills are acquired, specifically focusing on the R language for marketing data modelling and analysis.

Particular emphasis will be given to the analysis of specific problems in the marketing field, to the presentation of specific data sets, to the development of machine learning applications for marketing data analysis in R and to the evaluation of the results.

## Contents

The course is divided into four modules:

1. Organization and business management
2. Marketing analytics techniques
3. Analysis of specific marketing problems and development of R applications
4. Analysis of consumer choices

The main contents of the course are:

1. ***Organization and business management***
    - Elements of economy and business organization
    - financial statements
    - Business finance
2. ***Marketing analytics techniques***
    - Key Performance Indicators ; Monitoring and Reporting
    - Product and customer  analytics
    - Marketing mix and attribution modelling
    - Recommender systems
3. ***Economics***
    - Equilibrium prices
    - Price elasticity
    - Modelling consumer decisions
4. ***Analysis of specific problems in the marketing and development of applications in R***
    - Presentation and discussion of specific cases of marketing problems
    - Data preparation, visualization and analysis with machine learning techniques
    - Development of machine learning application in R

## Detailed program

1. ***Organization and business management***
    - Financial statement
    - Corporate finance
2. ***Marketing analytics techniques***
    - Key Performance Indicators ; Monitoring and Reporting
    - Product and customer  analytics
    - Marketing mix and attribution modelling
    - Recommender systems
3. ***Elements of economics***
    - Equilibrium prices
    - Price elasticity
    - Modelling consumer decisions
4. ***Analysis of specific marketing problems***
    - Presentation and discussion of specific cases of marketing problems
    - Preparation and visualization of the data: Business Intelligence (BI) and Data Modeling in the company environment
    - Data processing: introduction to the main machine learning techniques for marketing data analysis (e.g. regression, classification, clustering)
5. ***Lab*:*development of applications in R***
    - Introduction to R
    - Explorative / descriptive analysis of datasets
    - Application development of machine learning in R

## Prerequisites

- Probability and statistics for IT
- Software analysis and design

## Teaching form

The training activity will be divided into:

- lectures: in which the topics of microeconomics and organization and business management will be presented
- tutorials and laboratories: in which marketing data analytics topics will be presented with specific applications with real data. These activities will be preparatory to the planning and development of the end-of-course project which, for example, may consist in the implementation of a recommender system.may consist in the implementation of marketing analytics applications.

The course is *taught in Italian*.

## Textbook and teaching resource

The textbooks are :

- ***Digital marketing. Data, analytics, tecnologie e canali digitali***, Nico Di Domenica, Attilio Redivo, Edoardo Rozzoni, Gianluca Crippa, *Pearson Education Italia*
- ***Hands-On Data Science for Marketing***, Yoon Hyup Hwang, *Packt*
- ***R for Marketing Research and Analytics***, Chris N. Chapman, Elea McDonnell Feit Chapman, *Elea*

Furthermore, the following educational material is made available:

- Slides for all the course topics  prepared and distributed by the instructor.
- Additional material eg links to news, forums, specific web resources on the topics covered in class

## Semester

First semester

## Assessment method

The exam will be organized as follow:

**Oral exam**:

- ***Traditional***: oral exam at the end of the course that focuses on the topics covered in class by the two teachers. The oral exam regarding the topics of points 1,2 and  3 will not be required for students who have passed the intermediate test.
- ***Intermediate Check***: (mid-December): the test consists of a test with a set of questions (maximum 10) with open answers regarding the topics presented in points 1, 2 and 3 . Each question will be associated with a score, from 3 to 5. The student can answer any number of questions. The evaluation of the partial will be expressed through a quali-quantitative judgment: Insufficient [<18], Sufficient [18-> 22], Good [23-> 26], Excellent [27-> 30], Top [> 30]

**Laboratory Project in R:**

- Implementation of an application in R for the analysis of marketing data.
- Report
- Oral discussion of the project using a set of slides, with possible questions on the topics covered in the classroom on points 4,5.

Delivery times will be communicated on Moodle.

## Office hours

The two instructors are available for meet students or immediately after the lectures or setting up a meeting

anytime in office hours by email.

During the COVID emergency period oral examinations will take place remotely through thr Webex platform.On the e-learning page of the coursethere will be apublic linkfor accessing to the examination of possible virtual spectators.