



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Complex Data Analysis

1920-3-E4102B083

Learning objectives

To make students capable to set and lead data science projects on complex data systems, integrating their statistical competencies with skills on project management and communication.

Particularly, the course focuses on projects addressing soft and "open" questions, where a precise specification of analytical goals lacks, differently from a "classical statistics setting", but more similarly to current business and institutional contexts. There, in fact, new data sources are the basis for new services, whose design and implementation requires creativity, managerial and communicative skills as well as methodological competencies.

Knowledge and comprehension

The course aims at transferring know-how pertaining to the logic behind the design the development and the management of data science projects.

By means of real projects, the course provides sound bases for applications to all of data science fields and also to socio-economic statistics, biostatistics and all of other domains where complex data are to be treated.

Contents

The course illustrates the kind of activities that a data scientist performs in real organizations and the topic of how to manage data science projects. In practice, these topics are addressed by means of concrete projects to be managed by groups of students, with the supervision of the teacher.

Detailed program

The course is divided into two parts. In the first some lessons, under the form of seminars, will be held to touch upon some specific basic topics, In the second part, students will be assigned projects to be managed and concluded within the course.

PART I

1. Data science: similarities and differences with respect to "classical statistics"
2. The current technological and economic context: complex socio-economic processes, the need for new knowledge and innovative services.
3. Data complexity and new data sources: web, e-commerce, Internet of Things, Smartphones...
4. Examples of data science projects.
5. Basics of Project Management: specificities and criticalities of data science projects, data quality and technological choices.

PART II

Assignment of projects to students, setting of the project management activities and supervision by the teacher.

Prerequisites

There are no formal prerequisites but basic competencies in inferential statistics, data analysis, data mining and R programming are necessary

Teaching methods

Frontal lessons and project supervision, so as to verify the quality of the applied statistical methodologies and the capability to design, manage and present the project and its results.

Assessment methods

The competence level will be assessed by:

1. An ongoing evaluation of the way students face the management of the project and its difficulties.
2. A final oral presentation of the project and its result, with a critical discussion.

This assessment method is motivated by the goal to put students into the setting of real business activities and to make their soft skills (e.g. organizational, communicative) and creativity emerge.

There are neither special exams for students not attending the course, nor partial exams.

Textbooks and Reading Materials

Computers Ltd. What they really can't do, Harel D. OxfordUniversity Press, 2000

Documents and slides provided by the teacher

Web resources and TED Talks

Semester

II semester IV cycle

Teaching language

Italian
