



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Big Data Management and Analysis in Physics Research

2021-2-F9101Q024-F9101Q025M

Aims

Provide a complete and updated picture of the use of Big Data Analytics in the Physics sector

Contents

The Laboratory intends to provide detailed and updated examples of the use of Big Data Analytics in Physics research,

with a theoretical introduction to the various methodologies, examples of real data and the possibility of analyzing concrete cases in depth.

Detailed program

- 1) Introduction to Big Data in Particle Physics and Astrophysics.
- 2) Introduction to Python and Jupyter Notebook.
- 3) Pandas dataframe and libraries for data analysis.

- 4) Regression techniques applied to research in Physics.
- 5) Decision Trees in Physics research.
- 6) Clustering and classification in data analysis in Physics
- 7) Time series in Physics research.
- 8) Neural networks in data analysis in Physics.

Prerequisites

Basic knowledge of Python.

Teaching form

Frontal lessons and practical laboratory sessions. During the Covid-19 emergency period, lessons will take place in mixed mode: partial attendance and videotaped lessons.

Textbook and teaching resource

Slides and additional material in english will be provided to students.

Semester

Second semester.

Assessment method

Oral exam. Discussion of exercises proposed during the laboratory sessions. During the Covid-19 emergency period, oral exams will only be online. They will be carried out using the WebEx platform and on the e-learning page of the course there will be a public link for access to the examination of possible virtual spectators.

Office hours

On appointment.
