UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Big Data Management and Analysis in Physics Research

2425-2-FDS01Q024-FDS01Q026M

Aims

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

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 Jupiter 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, alla ctivities will be held in presence.
Lessons will be in instructional mode, while laboratory sessions will be in interactive mode.

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.

Office hours

On appointment.

Sustainable Development Goals