A.A. 2023/2024

PREREQUISITES

Basic knowledge of the Python language and key concepts of Data Science.

DEVELOPMENT OF THE COURSE

The course includes both practical and theoretical lessons.

Knowledge and Understanding

The goal of the course is to provide a detailed description of typical approaches in Data Science using the Python programming language and its related libraries. Additionally, a solution for creating data apps will be studied. The reference development environments will be Jupyter Notebook and PyCharm.

Capacity to apply knowledge and understanding

At the end of the course, students will be able to apply the typical approaches of Data Science using Python and its related libraries. These skills will be acquired through exercises that require the application of methodologies and concepts described during the lessons.

Transversal skills

The skills acquired in this course aim to provide students with tools to address Data Science projects using Python and its related libraries. The student will be able to apply some of the methodologies presented in class through other programming languages as well.

PROGRAM

(1) Loading and manipulation of data using Python and its related libraries.

(2) Data Visualization approaches using Python and its related libraries.

(3) Study of approaches to address typical problems in Data Science and Machine Learning using Python and its related libraries.

(4) Example of data apps creation using Python and its related libraries.

Learning Evaluation Methods Examination

The exam includes the development of a Data Science project along with a detailed report and an oral exam to discuss the obtained results. The project will be conducted in groups and will require the use of Python and its related libraries on real datasets chosen by the students.

Learning Evaluation Criteria

To pass the exam, the student must demonstrate, through the project and the oral exam, their understanding of the fundamental concepts of the course and their proficiency in the methodologies of carrying out a Data Science project using Python. The highest grades will be given to students who exhibit excellent knowledge of the language and its related libraries, as well as exceptional skills in interpreting and presenting the project's results.

Learning Measurement Criteria

The student learning will be measured with a maximum of 30 points, possibly cum laude.

Final Mark Allocation criteria

The overall grade depends primarily on the quality of the projects and the contribution demonstrated by the student. During the oral exam, the quality of the project presentation and the knowledge of the course topics will be taken into consideration.

RECOMMENDED READING

Slides provided by the professor.

- J. Grus. “Data science con python. Dai fondamenti al machine learning”. O’Reilly, 2021.
- A. Geron. “Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, 2nd Edition”. O’Reilly, 2019.
- S. Skiena. “The Data Science Design Manual”. Springer, 2017.