Data Analysis

Academic Year: (2024 / 2025) **Review date: 15-05-2024**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: FERNANDEZ REBOLLO, FERNANDO

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

We recommend to have passed the subject of Introduction to Financial Markets

OBJECTIVES

The objective of this course is to provide the student with data analytics skills in areas related to the financial sector. Specifically, the student will be able to use data analysis tools (statistical, visual) and machine learning (classification, regression, etc.) to, for example, make predictive analysis of time series.

DESCRIPTION OF CONTENTS: PROGRAMME

DATA ANALYSIS
1. Introduction to the Analysis of Financial Data
2. Exploratory analysis and visualization tools
3. Financial data cleaning and transformation
4. Supervised predictive models
5. Model evaluation and backtesting in finance
6. Unsupervised models and other learning paradigms

LEARNING ACTIVITIES AND METHODOLOGY

The course follows the Master idea complementing on-site classes with e-learning activities.
These activities are summarized as follows:

AF1: Lectures: Theoretical presentations accompanied by digital presentations
AF3: Theoretical and practical classes: Combination of lectures accompanied by the resolution of practical exercises
AF4: Laboratory practices: Guided practices in computer rooms
AF5: Tutorials: Personalized on-site or remote tutorials
AF2: E-learning activities: Remote activities that the student develops independently. These activities include: Participation in forums, viewing pre-recorded contents, and guided exercises
AF7: Individual work of students: Individual student activities that complement the other activities (both classroom and non-classroom) and exam preparation

Teaching methodology

MD1: Teachers give lectures with support of digital presentations, in which they develop the subject.
MD3: Practical cases that are solved with a guided provided by the teacher.
MD5: Individual or group preparation of practices and reports
MD6: Specific e-learning activities including visualization pre-recorded content, self-review activities, participation in forums, etc.

ASSESSMENT SYSTEM

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

The evaluation of the subject will be done by continuous assessment during the term and with a final exam. Continuous assessment will consist of small guided practices and a final project. The final exam is theoretical and practical. It has a minimum score of 4 points.

The weighting of the evaluation is:
- Student participation: 10%
- Final and guided practices: 30%.
- Final exam: 60%. It may Include an individual face-to-face evaluation (30%) and written exam (30%)

BASIC BIBLIOGRAPHY

- Luis Torgo Data Mining with R: Learning with Case Studies, Second Edition, CRC Press, 2017