Data Analysis

Academic Year: (2020 / 2021) **Review date: 13-07-2020**

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 skills acquired by the student will be:
- Ability to apply the correct knowledge to solve problems in new environments related to their field of study
- Ability to communicate their conclusiones to specialized and non-specialized public without ambiguity
- Learning skills that enable them to continue studying autonomously.
- Ability to understand and apply methods and techniques in the field of Computer Engineering in financial markets
- Ability to conceive, design or create, implement and adopt a substantial process of development or creating software for financial markets
- Ability to work in multi-disciplinary environments and in large heterogeneous development teams
- Ability to implement algorithms and classical techniques of financial markets following the standards and established procedurest
- Knowledge of the main tools for managing large amounts of data for storage, access and review

As learning outcomes will be:
- Identify and correct errors or omissions in historical financial data
- Construct and interpret graphs showing the relationships between different variables
- Build predictive models from historical financial data
- Assess predictive models in the context of time series
- Analyze the impact of financial events.

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:

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

Teaching methodology

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

ASSESSMENT SYSTEM

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:
- Guided Practices: 30%
- Final Practical Project: 40%
- Final exam: 30%

% end-of-term-examination:	30
% of continuous assessment (assigments, laboratory, practicals…):	70

BASIC BIBLIOGRAPHY

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