Advanced Data Analysis

Academic Year: (2021 / 2022)   **Review date: 10-06-2021**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: LEDEZMA ESPINO, AGAPITO ISMAEL

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 2

OBJECTIVES

The objective of the course is to provide the student with the necessary knowledge about advanced data analysis techniques, including machine learning, data mining, Artificial Intelligence, and their application in IoT-related sectors. In the same way, the student should know the principles and methods related to these techniques and their applicability in various environments.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction
2. Data Mining & Machine Learning
3. Methodologies
4. Exploration of the data
5. Regression & classification
6. Clustering & association
7. Other topics (Incremental learning, Time series, Text Analytics)

LEARNING ACTIVITIES AND METHODOLOGY

FORMATION ACTIVITIES:
- Theoretical classes.
- Laboratory practices.
- Teamwork
- Individual student work

METHODOLOGY:

- Exhibitions in the teacher's class with the support of computer and audiovisual media, in which the main concepts of the subject are developed, and the bibliography is provided to complement the students' learning.
- Critical reading of texts recommended by the teacher of the subject: Press articles, reports, manuals, and/or academic articles, either for further discussion in class or to expand and consolidate the knowledge of the subject.
- Resolution of practical cases, problems, etc., raised by the teacher individually or in a group.
- Preparation of papers and reports individually or in groups.
- Exposition of projects in virtual classrooms.
- Participation in discussion forums.

TUTORIALS:
- Individual tutorials that will allow the student to consult individually with the professor specific doubts about the subject of the program and the exercises/problems proposed.
- Group tutorials that will allow work teams to resolve doubts related to group assignments.

ASSESSMENT SYSTEM

- Class participation: 10%
- Individual or group work carried out during the course (projects, practices, continuous assessment tests, etc.): 60%
- Final project: 30%

% end-of-term-examination: 0

% of continuous assessment (assigments, laboratory, practicals…): 100

BASIC BIBLIOGRAPHY

 - Mohammed, Mohssen ; Khan, Muhammad ; Bashier, Eihab Machine Learning, CRC Press, 2016

 - Sayan Mukhopadhyay Advanced Data Analytics Using Python With Machine Learning, Deep Learning and NLP Examples, Berkeley, CA : Apress, 2018
 - Witten, Ian H. ; Frank, Eibe ; Hall, Mark A. ; Pal, Christopher J. Data Mining: Practical Machine Learning Tools and Techniques (4th ed.), Elsevier Science, 2016

ADDITIONAL BIBLIOGRAPHY

 - Bostjan. Kaluza Instant Weka how-to, Birmingham: Packt Pub, 2013

 - Gilchrist, Alasdair Industry 4.0 : The Industrial Internet of Things, Apress L. P., 2016

 - Gollapudi, Sunila Practical Machine Learning, Packt Publishing, 2016