Machine Learning in TImeseries and Data Streams

**Academic Year:** ( 2022 / 2023 )　　　　　　　　　　　　　　　　　　　　　**Review date: 19-05-2022**

**Department assigned to the subject: Computer Science and Engineering Department**

**Coordinating teacher: IGLESIAS MARTINEZ, JOSE ANTONIO**

**Type: Electives　ECTS Credits : 3.0**

**Year : 1 Semester : 1**

DESCRIPTION OF CONTENTS: PROGRAMME

Time series:
 - Overview of time series.
 - Data preparation.
 - Autoregressive and automated methods.
 - Supervised learning techniques for time series.
 - Applications.

Incremental learning:
 - Overview of incremental learning.
 - Unsupervised incremental learning.
 - Supervised incremental learning.
 - Applications

LEARNING ACTIVITIES AND METHODOLOGY

Training Activities:
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AF1 - Theoretical class
AF3 - Theoretical-practical classes
AF5 - Individual and group tutorials
AF6 - Group work
AF7 - Individual student work

Teaching methodology:
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MD1: Class lectures by the lecturer 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.
MD2: Critical reading of texts recommended by the subject teacher: press articles, reports, manuals and/or academic articles, either for subsequent discussion in class or to expand and consolidate knowledge of the subject.
MD3: Resolution of practical cases, problems, etc... posed by the teacher individually or in groups.
MD4: Presentation and discussion in class, under the moderation of the teacher, of topics related to the content of the subject, as well as practical cases.
MD5: Preparation of individual or group work and reports.

ASSESSMENT SYSTEM

The assessment will consist of several continuous assessment activities and a final exam.

Continuous assessment will be 80% of the final mark for the course and will consist of:
 - Class participation: 10%.
 - 2 Group practicals: 70% (2*35%).

In addition, the student must take a final exam (20%) and obtain a mark of 4 or more to be able to add the mark obtained through
continuous assessment.

**% end-of-term-examination:**      20

**% of continuous assessment (assigments, laboratory, practicals…):**      80

BASIC BIBLIOGRAPHY

 - Bifet, Albert Machine Learning for Data Streams: with Practical Examples in MOA, Cambridge: MIT Press, 2018

 - Bifet, Albert ; Gavaldà, Ricard ; Holmes, Geoff ; Pfahringer, Bernhard Machine Learning for Data Streams: with Practical Examples in MOA, Cambridge: MIT Press, 2018
 - Konar, Amit ; Bhattacharya, Diptendu Time-Series Prediction and Applications: A Machine Intelligence Approach, Springer International Publishing, 2017
 - Lazzeri, Francesca Machine Learning for Time Series Forecasting with Python, Newark: John Wiley & Sons, 2020

 - Moamar Sayed-Mouchaweh editor. Learning from Data Streams in Evolving Environments Methods and Applications, Cham: Springer International Publishing, 2019