

69721 - Machine Learning

Syllabus Information

Academic Year: 2021/22

Subject: 69721 - Machine Learning

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 633 -

ECTS: 3.0

Year: 2 and 1

Semester: Second semester

Subject Type: Optional

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It has an applied orientation so the different techniques explained will be illustrated with real cases. Although the mathematical and statistical content is important, we will rather focus on assimilation and understanding of the concepts, using the mathematical knowledge when necessary for their understanding.

The techniques introduced in the lectures will be applied to real problems through simulations in the laboratory sessions using python and scikit-learn, tensorflow, pytorch. Finally, the student must address, as the final course assignment, one case study in greater depth, developing a complete real case of pattern recognition, obtaining not only numerical results, but also being able to interpret them properly.

4.2. Learning tasks

The course includes the following learning tasks:

- A01 Lectures (18 hours). The fundamental contents of the course will be presented and a set of representative problems will be made. This activity will take place in the classroom. Lecture notes and materials will be available to students through the virtual platform Moodle (ADD).
- A03 Laboratory sessions (8 hours). Representative examples will be developed in the laboratory. The details and instructions of the tasks will be available on Moodle.
- A06 Tutorials. Supervision of the assignments and tasks to be developed by the students.
- A08 Assessment.
- A06 Assignments. Preparation of tasks and work for laboratory sessions. They can be done individually or in pairs.
- A07 Autonomous work and study. This activity includes both personal study aimed at achieving adequate monitoring of the course, doing tasks, exam preparation and tutorials.

4.3. Syllabus

The course will address the following topics:

- 1. Introduction to pattern recognition
- 2. Pattern recognition models:
 - Probabilistic models
 - Decision trees
 - Linear models
 - Neural networks
 - Hidden variable models
- 3. Feature extraction

4.4. Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website.

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=69721>