

## 67245 - Electronic systems for access control and security

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 67245 - Electronic systems for access control and security

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 622 - Master's in Electronic Engineering

**ECTS:** 6.0

**Year:** 1

**Semester:** Second semester

**Subject type:** Optional

**Module:**

### 1. General information

In the context of intelligent environments, access control by user identification is one of the key issues to be addressed. This course addresses several fields of application in intelligent environments, ranging from the micro system made up of a terminal and a user, to more complex environments such as a city or road infrastructure.

These approaches and objectives are aligned with some of the Sustainable Development Goals, SDGs, of the 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>) and certain specific goals:

- Goal 3: Ensure healthy lives and promote well-being for all at all ages. Target 3.6 By 2020, halve the number of deaths and injuries caused by traffic accidents in the world
- Objective 9: Industry, innovation and infrastructures. Target 9.5 Increase scientific research and improve the technological capacity of the industrial sectors of all countries, particularly developing countries.

### 2. Learning results

Learn about the different existing technologies in automatic identity identification, distinguishing which is the ideal technology according to the field of application.

Evaluate different verification algorithms, providing the rate of false acceptance and false rejection.

Design and evaluate electronic systems for their application in access control and/or automatic identification of people and goods.

Student is able to continue learning continuously and autonomously.

### 3. Syllabus

#### Theory

T1: Introduction to Machine Learning

T2: Introduction to Electronics systems for Access control

T3: Biometrics

T4: Traffic monitoring and vial security

T5: Video-surveillance

#### Laboratory sessions

S1: Face detection

S2: Facial biometrics

S3: Fingerprint recognition

S4: Motion detection

S5: Tracking: traffic monitoring application

S6: Video-surveillance application

### 4. Academic activities

**Lectures (20h)**

The fundamental contents of the course will be introduced.

**Practice sessions** (10h)

In this activity, a set of representative problems will be solved.

**Laboratory sessions** (18h)

Representative examples will be carried out in the laboratory.

**Assignments** (36h)

Individual or group assignments will be proposed, in the form of a course project. The assessment criteria is based on: difficulty, development, achieved results, quality of the written report and oral presentation.

**Study** (60h)

Study, preparation of laboratory work and time for preparing the final exam. Students can also attend tutorials to solve specific problems.

**Evaluation activities** (6h)

Assessment.

## 5. Assessment system

The subject will be evaluated only in the global evaluation modality through the following activities:

- **Test 1:** Theoretical exam: rating from 0 to 10 points (**20% final grade**). There will be an individual written exam made up of several multiple choice or short answer questions.
- **Test 2:** Laboratory exam: rating from 0 to 10 points (**30% final grade**). Students who have obtained a practical qualification greater than or equal to 4 points during the course will be exempt from this exam. The exam will consist of solving a case similar to those developed during the course in the laboratory practice sessions.
- **Test 3:** Oral presentation of practical work: qualification from 0 to 10 points (**50% final grade**). Both the report submitted and the suitability and originality of the proposed solution will be taken into account.