

## 60036 - Intelligent Instrumentation

### Información del Plan Docente

Academic Year	2016/17
Academic center	100 - Facultad de Ciencias
Degree	538 - Master's in Physics and Physical Technologies
ECTS	5.0
Course	1
Period	First semester
Subject Type	Optional
Module	---

### 1. Basic info

#### 1.1. Recommendations to take this course

#### 1.2. Activities and key dates for the course

### 2. Initiation

#### 2.1. Learning outcomes that define the subject

#### 2.2. Introduction

### 3. Context and competences

#### 3.1. Goals

#### 3.2. Context and meaning of the subject in the degree

#### 3.3. Competences

#### 3.4. Importance of learning outcomes

### 4. Evaluation

### 5. Activities and resources

#### 5.1. General methodological presentation

The teaching-learning methods to achieve the course objectives and acquire the intended competencies are:

- Lectures classes and case-based Learning comprising the core contents of the course (3 ECTS)
- Individual and/or small group resolution of questions, problems and proposed thematic works, and their presentation and defense (1 ECTS)
- Laboratory sessions and demos. Preparation of reports (1 ECTS)

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### 5.2.Learning activities

- Lecture classes on the main topics.
- Individual and/or small group resolution of questions, problems and proposed thematic works.
- Interactive defense of problems and thematic works
- Laboratory work, leading to the design and characterization of a complete acquisition measurement system with control instrumentation.

### 5.3.Program

1. Electrical Modeling of physical sensors.
2. Specific electronic Interfaces: low current, high strength, low noise, ...
3. Analog Signal Processing: linear and nonlinear.
4. Digital and quasi-digital conversion techniques.
5. Digital Signal Processing.
6. High performance electronic instrumentation: SMUs, nanovoltmeters, picoammeters ...
7. Standard instrumentation buses.
8. Automatic control of processes and remote labs.

### 5.4.Planning and scheduling

The distribution of the different activities will be given according to the academic calendar of the corresponding course. They will be performed according the schedule set in advance by the faculty.

### 5.5.Bibliography and recomended resources