

29516 - Digital Signal Processing

Syllabus Information

Academic year: 2023/24

Subject: 29516 - Digital Signal Processing

Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia

Degree: 625 - Bachelor's Degree in Industrial Processes' Data Engineering

ECTS: 6.0

Year: 3

Semester: Second semester

Subject type: Compulsory

Module:

1. General information

The general objective of the subject is to provide the necessary knowledge to interpret and solve analog electronic circuits, especially in the areas of operational amplifiers and operational amplifiers.

These approaches and objectives are aligned with the following **Sustainable Development Goals (SDGs)** of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>) and certain specific targets, so that the acquisition of the learning results of the subject will contribute to some extent to the achievement of targets **4.1** and **4.7** of **Goal 4**, targets **9.1** and **9.4** of **Goal 9**, and targets **12.2** and **12.5** of **Goal 12**.

2. Learning results

- Understand the principles of digital signal processing.
- Know how to design digital filters.
- To know the ways of encoding and compressing signals.

3. Syllabus

Block 1: SIGNAL THEORY AND PROCESSING

1. Signal theory.
2. Digital processing of one-dimensional and multidimensional signals.

Block 2: FEATURE EXTRACTION

3. General signal preprocessing.
4. Basic and advanced feature extraction.

Block 3: APPLICATIONS

5. Industrial applications.

4. Academic activities

The indicative time distribution of a teaching week would be as follows:

- **Lectures:** 3 hours per week.
- **Laboratory practices:** 1h per week.
- **Other activities:** 4 hours per week.

On the other hand, the four-month period will include:

- **30 hours of lectures.**
- **12 hours of laboratory practice**, in 1-hour sessions.
- **4 hours of written evaluative tests**, two hours per test.
- **15 hours of exercises and supervised work.**

The rest of the time up to 150 hours can be devoted to personal study.

5. Assessment system

The assessment process includes two types of actions:

- **Continuous** assessment system.
- **Global** assessment system.

The following aspects will be assessed in the **continuous assessment**:

- **Written tests** (50%-70% of the grade, minimum 4 out of 10): two midterm exams.
- **Practicals** (30% of the grade, minimum 4 out of 10): assessment of skills in the handling of laboratory material and the presentation of results reports.
- **Other activities** (0%-20% of the grade): problems and challenges to students through the Moodle platform.

These activities will be developed according to the time available.

- Defense of **voluntary work** (up to 10% extra of the grade): oriented to industrial applications of PDS.

The **minimum attendance** to the lectures of theory/problems as well as to the practical laboratory classes will be **80%**.

Absences must be properly excused.

The following aspects will be assessed in the **global assessment**:

- **Written tests** (70% of the grade, minimum 4 out of 10): two mid-term exams.
- **Practicals** (30% of the grade, minimum 4 out of 10): tests to evaluate skills in the handling of laboratory material.