

## 28812 - Electrical Engineering

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 28812 - Electrical Engineering

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

**Degree:** 424 - Bachelor's Degree in Mechatronic Engineering

**ECTS:** 6.0

**Year:** 2

**Semester:** First semester

**Subject type:** Compulsory

**Module:**

### 1. General information

The purpose of this course is that the student acquires the necessary knowledge to analyse the different types of electrical circuits according to the nature of the power supply, as well as the transient response, using the necessary instruments and software.

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 goals, 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

- Interpret and solve electrical circuits in different operating regimes.
- Notions of theoretical aspects-practical aspects of electrical machines.
- Resolution of electrical lines.
- Mastering basic laboratory instruments.
- To know aspects related to the generation, transport and distribution of electric energy.
- Drawing and interpreting plans and diagrams according to the appropriate standards and symbology.

### 3. Syllabus

#### BLOCK 1

- Topic I: Previous concepts.
- Topic II: Elements of an electrical circuit.
- Topic III: Fundamental concepts and laws.
- Topic IV: Circuit analysis techniques.

#### BLOCK 2

- Topic V: Single-phase alternating current in Sinusoidal Permanent Regime.
- Topic VI: Power in Sinusoidal Permanent Regime.
- Topic VII: Time domain analysis: first order circuits.

#### BLOCK 3

- Topic VIII: Fundamental principles of electrical machines.

### 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** (60%-80% of the grade, minimum 4 out of 10): two midterm exams.
- **Practicals** (20% 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 electrical machines.

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** (80% of the grade, minimum 4 out of 10): two mid-term exams.
- **Practicals** (20% of the grade, minimum 4 out of 10): tests to evaluate skills in the handling of laboratory material.