

## 25816 - Electric and electronic technology

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 25816 - Electric and electronic technology

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

**Degree:** 558 - Bachelor's Degree in Industrial Design and Product Development Engineering

**ECTS:** 6.0

**Year:** 2

**Semester:** Second semester

**Subject type:** Compulsory

**Module:**

### 1. General information

The main objective of this subject is that the student acquires the basic knowledge on the use of the electrical energy in its various forms of power supply (direct current and alternating current) and its practical application. Its approach is focused on the industrial design of devices containing an electrical or electronic component.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the 2030 Agenda of the United Nations (<https://www.un.org/sustainabledevelopment/es/>), specifically, the learning activities planned in this subject will contribute to the achievement of target 8.8 of Goal 8.

### 2. Learning results

- Analyze direct and alternating current circuits.
- To know the principle of operation, characteristics and applications of the main electrical and electronic devices.
- To be able to identify the main electrical and electronic elements and components that make up some of the devices and devices on the market and in industry.
- Interpret technical documentation issued by manufacturers and institutions regarding electrical and electronic devices available on the market and in the industry.
- To become aware of the risks of electrical energy and to know the safety regulations for electrical installations and devices.

### 3. Syllabus

Unit 1: Basic concepts of electricity and direct current

Unit 2: Diodes, voltage regulators and transistors

Unit 3: Basic concepts of magnetic fields

Unit 4: Single-phase alternating current electrical circuits

Unit 5: Three-phase alternating current electrical circuits

Unit 6: Direct current electrical machines

Unit 7: Asynchronous alternating current electrical machines

Unit 8: Distribution of electric power and low voltage facilities

Unit 9: Electrical protection and safety in electrical devices

### 4. Academic activities

**Theoretical and problem classes:** sessions with the teacher in which the subject matter will be explained, combined with the resolution of practical cases: 45 hours.

**Laboratory practices:** sessions where the student will carry out assemblies and electrical measurements: 15 hours.

**Study of the subject:** Individual study of the contents seen in the classes: 60 hours.

**Practical work:** Completion of a module work (integrating knowledge of all the subjects of the semester) where the student demonstrates the application of the acquired knowledge to design a system with electronic control, including component selection and programming of the control device: 25 hours.

**Assessment tests.** 5 hours.

### 5. Assessment system

The subject is assessed according to one of the following systems:

I. Mixed system, which is composed of the following assessment activities:

- Laboratory practices: 15% of the grade (minimum 5 out of 10 in each of the 5 practices).
- Partial test: 10% of the grade. It consists of an intermediate control test, with a theoretical part (type test) and a practical part (problem solving).
- Module work: 30% of the grade.
- Final written test: 45% of the grade (minimum 5 out of 10). It consists of a written test, with a theoretical part (test type) and a practical part (problem solving), which evaluates all the knowledge seen in the classroom classes (a minimum of 3.5 out of 10 is required in each of the two parts to average and pass).

II. Simple system, based exclusively on a global final test consisting of two parts:

- Final written test: 80% of the grade (minimum 5 out of 10). It consists of a written test, with a theoretical part (type test) and a practical part (problem solving), which evaluates all the knowledge seen in the classroom classes (a minimum of 4 out of 10 is required in each part to average and pass).
- Practice test: 20% of the grade (minimum 5 out of 10). On-site examination in the practical laboratory.