

## 29812 - Basic principles of electronics

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 29812 - Basic principles of electronics

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

326 - Escuela Universitaria Politécnica de Teruel

**Degree:** 440 - Bachelor's Degree in Electronic and Automatic Engineering

444 - Bachelor's Degree in Electronic and Automatic Engineering

**ECTS:** 6.0

**Year:** 2

**Semester:** First semester

**Subject type:** Compulsory

**Module:**

### 1. General information

The subject provides students with basic knowledge about some electronic components: diodes, bipolar transistors and field effect transistors, as well as about some of their application circuits, enabling them to analyze, design and simulate simple electronic circuits, in order to achieve the expected learning results. The teaching-learning process is articulated from the need or scenario, to the device and the solution.

For this purpose, the scripts of the practices of the subject are used, so that theory and practice are perfectly intertwined. The prerequisites for this subject are knowledge of electrical engineering.

These approaches and objectives are aligned with some of the Sustainable Development Goals, <https://www.un.org/sustainabledevelopment/es/> such as SDG 7, target 7.1.

### 2. Learning results

- Identify the applications and functions of electronics in engineering.
- Know how to use electronic circuit analysis techniques.
- Know the technological fundamentals and models of electronic devices.
- Have aptitude to apply the devices in basic electronic circuits of use in Engineering.
- Handle the instruments of a basic electronics laboratory and uses electronic simulation tools.

### 3. Syllabus

Contents:

- Conduction in semiconductors.
- Diodes: static behavior.
- Diodes: rectification and filtering.
- Diodes: dynamic behavior.
- Bipolar transistors.
- Application circuits with bipolar transistors.
- Field effect transistors.

Practical classes:

- Electronic simulation of circuits.
- Diodes: static operation and basic circuits.
- Diodes: dynamic behavior.
- Bipolar transistor: voltage operation.
- Bipolar transistor: operation in current and as a switch.

### 4. Academic activities

- Lectures (30 horas). Fundamental contents of the subject are presented.
- Problem classes (15 hours). In this activity, application problems are solved.
- Practical sessions (15 hours). There are five mandatory internships. The student must deliver, at the beginning, a document containing a justified estimation of the expected results and, at the end, a document explaining and justifying the divergences between the expected results and those obtained.
- Practical work (15 hours). These works refer to the preparation of the internships and the generation of the

corresponding documents.

- Personal study and work (73 hours).
- Assessment (2 hours).

## 5. Assessment system

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- Theory-problem exam. In the case of the exam, the official global test published by EINA will be used and will be worth 80% of the final grade.
- Laboratory practices: There will be a continuous assessment and, in case of failure, a practice exam.

The practices will account for 20% of the final grade, divided into 10% for the previous work, to be handed in at the beginning of the practices, and another 10% assigned to the development of the practice and the achievement of its objectives. Throughout the practice, the teacher may ask as many questions as he/she deems appropriate for the correct evaluation of the previous preparation and performance. The teachers will inform the students of the appropriate corrective measures and, if necessary, of the need to take the practice exam. If a practice exam is required, students must hand in, at the beginning of the exam, the preparatory work of all the practices of the course.

The students have available the content of the syllabus, a collection of solved problems, a collection of solved exams and guides for the elaboration of the practices.

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One of these two options is available:

- 100% grade corresponding to the grade of the final written exam of the subject.
- 80% of the grade corresponding to the grade of the final written exam and the remaining 20% associated with the score obtained in the practices and proposed works.

In both cases, the final exam will consist of theoretical and practical questions and problems.

In the laboratory practices and associated work, the ability to assemble or simulate electronic circuits and the interpretation of the results will be assessed. The preparatory exercises for the internship and the report itself must be submitted.

Students who decide that the practicals are not to be graded, must either complete all the practical sessions or pass a laboratory exam which grade will be simply pass or fail.