

## 28710 - Electrotechnics

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 28710 - Electrotechnics

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

**Degree:** 423 - Bachelor's Degree in Civil Engineering

**ECTS:** 6.0

**Year:** 2

**Semester:** Second semester

**Subject type:** Basic Education

**Module:**

### 1. General information

The subject and its expected results respond to the following approaches and goals:

- Students' knowledge of transport, distribution and consumption of electrical energy.
- Theory of electrical circuits depending on the power supply.
  - Direct current circuits
  - Single-phase and three-phase alternating current circuits.
- Power of electrical systems
- Calculate electrical lines.
- Low and high voltage regulations.

#### **Alignment with the SDGs:**

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (<https://www.un.org/sustainabledevelopment/es/>). The subject provides training and competence in these objectives:

- Goal 4: Quality education (M 4.3 and M4.4)
- Goal 7: Affordable and non-polluting energy (M 7.1, 7.3 and 7.a)
- Goal 9: Industry, innovation and infrastructure (M 9.4)

### 2. Learning results

The student, in order to pass this subject, must demonstrate the following results...

- Classify, analyze, calculate and design the use of direct and alternating current electrical circuits in single-phase and polyphase systems.
- Analyze, calculate and design energy needs, electrical power and its distribution in civil works.
- Design, calculate and define, from the technical, scientific and social points of view, the generation, transformation and distribution of electrical energy.
- Calculate and design single-phase and three-phase direct current power lines.
- Identify, interpret, calculate, design and justify the switching, measurement, protection and safety elements in the electrical installations of electrical installations in civil works.

### 3. Syllabus

"If this teaching could not be done in person due to health reasons, it *would be done telematically*" The syllabus is structured around two complementary content components:

#### **THEORETICAL CONTENTS.**

- **TOPIC 1:** Basic electrical concepts.
- **TOPIC 2:** Electrical Schematics. Protection and control elements.
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- **TOPIC 4:** On-site installation.
- **TOPIC 5:** Basic concepts of single-phase sinusoidal alternating current.
- **TOPIC 6:** Basic alternating sine wave circuits
- **TOPIC 7:** Three-phase alternating sine wave current
- **TOPIC 8:** Calculation of single-phase and three-phase lines.
- **TOPIC 9:** Lighting

## **PRACTICAL CONTENTS.**

**TOPIC 3:** Generation, transmission and distribution of electric power.

- **PRACTICE LAB 1:** Introduction to laboratory instrumentation.
- **PRACTICE LAB 2:** DC circuits.
- **PRACTICE LAB 3:** AC circuits.
- **PRACTICE LAB 4:** Lighting of a civil work

## **4. Academic activities**

**Theoretical classes (3h/week):** The theoretical concepts of the subject will be explained.

**Classroom practice/seminars/workshops (1h/week):** Practical examples will be explained by the teacher, where concepts and procedures will be applied, as well as the use of computer tools..

**Tutored practical work-Tutorials (5h/week):** Individual and group practices, carried out by the students and supervised by the teacher. (Dedication of the students to the subject)

**Work and personal study (1h/week):** Individual dedication to assimilate learning. (Dedication of students to the subject)

As well as group and individual tutoring, at the request of the students.

## **5. Assessment system**

### **Continuous Assessment**

- **Participation.**
  - Classroom attendance > 75%.
  - Attendance at visits and talks > 90%.
- **Written tests (65%)**
  - One test for each subject except T1and2 and T3and4 which are taken together
  - To compute or average grade > 40% of the value of the test.
- **Individual work(s) (25%)**
  - Each work will count equally in 25% of the total
  - Defense to be agreed with the teacher
- **Laboratory practices (10%)**
  - Completion of practice scripts for each of the practices carried out.

Up to two written tests not passed during the continuous assessment may be retaken in the first call.

Delivery of practices:

-One week before call.

### **Final Assessment (Call)**

When the student is unable to adapt to continuous assessment.

**-Individual theoretical assessment test (100%).**

-Students must pass a theoretical and/or practical test of the entire subject.