

## 28808 - Statistics

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 28808 - Statistics

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

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

**ECTS:** 6.0

**Year:** 1

**Semester:** Second semester

**Subject type:** Basic Education

**Module:**

### 1. General information

This subject introduces the student to the second great block of statistics, statistical inference based on the calculation of probabilities.

Starting from the possibility of occurrence of an event, the concept of probability associated with experiments in which there is some uncertainty about what will happen will be defined. From here we start in the study of probability, which in itself provides solutions to different problems. Probability Theory is the basis for the study of Statistical Inference, in which mathematical models will be provided to help us to know the different random variables from the data of a sample.

The final objective is that the student integrates the basic knowledge that together with the skills in the tools used in the course, students will be able to make decisions as well as the elaboration of the necessary reports for professional development as a data engineer.

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/>) so that the acquisition of the learning outcomes of the subject provides training and competence to contribute to some extent to their achievement:

- Goal 4: Quality Education

### 2. Learning results

To pass this subject, students shall demonstrate they has acquired the following results:

- Application of the basic concepts of differential and integral calculus, linear algebra, statistic and probability. Knowledge of the specific mathematical software and its use on the problem solving.
- Knowledge of mathematical terminology, notation and methods.
- Critical analysis of the obtained results.

### 3. Syllabus

The content of the subject is as follows:

- Descriptive statistics.
- Probability.
- Random variables and probability distributions.
- Introduction to reliability theory.
- Point and interval estimation.
- Parametric and nonparametric hypothesis testing.
- Multiple linear regression.

### 4. Academic activities

Since the subject consists of 6 ECTS credits, and each one of them consists of 25 hours divided into 10 hours of tutored work and 15 hours of independent work, the face-to-face learning activities (theoretical classes, practical classes and seminars) and continuous assessment activities (participation controls and written tests) will occupy 60 hours during the semester.

Other face-to-face activities such as personal tutorials and non-face-to-face activities ones such as study for the assimilation of concepts and techniques, practice for familiarization with computer tools, problem solving and exam preparation, will require 90 hours of autonomous work by the student. All these activities should add up to the 150 hours necessary to achieve the learning results of the subject.

The specific and complete planning of the course will be made known to the students at the beginning of the term. All evaluation activities will then be fixed, except for schedule adjustments that will be notified well in advance. Also from the beginning of the term the dates of the official calls will be fixed from the address of the center.

## 5. Assessment system

At the beginning of the subject the student will choose one of the following two assessment methodologies:

- A **continuous assessment system**, which will be carried out throughout the entire teaching period.
- A global **assessment test**, reflecting the achievement of the learning results, at the end of the teaching period.

### Continuous assessment system:

- Written tests: There will be two written tests along the term. They will deal with theoretical and/or practical aspects of the subject, their weight will be 60%. A **minimum grade of 3** on each written test is required for to continue with the continuous assessment:
  - Written test 1: It will take place on week 8 and will deal with the topics taught in the first 8 weeks of the subject.
  - Written test 2: It will be held on week 15 and will deal with the topics taught in the second half of the subject.
- Participatory controls: Throughout the course the student will carry out participatory controls valued as a whole in a 20% of the final grade, which will consist of the realization of practical exercises.
- Applied work: Throughout the term, the student will carry out an applied work on the subjects of the subject, it weights 20% of the final grade.

**Global assessment test:** Students who have not passed the course with the continuous assessment system, must take a compulsory written test equivalent to the written tests described in point 1, whose weight in the final grade will be 80%. Likewise, they must submit the 2 applied papers required during the term.