

## 29707 - Fundamentals of computing

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 29707 - Fundamentals of computing

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

**Degree:** 434 - Bachelor's Degree in Mechanical Engineering

**ECTS:** 6.0

**Year:** 1

**Semester:** 434-First semester o Second semester

330-Second semester

107-Second semester

**Subject type:** Basic Education

**Module:**

### 1. General information

The objective of this subject is to enable the student to solve an information processing problem by creating simple programs through the creation of simple programs by means of the realization of computer programs; also, to know the constituent elements of a computer, to understand its basic operation, and be able to search for information and apply knowledge of programming and problem solving knowledge in software tools and applications of interest for the degree.

In terms of the Sustainable Development Goals (SDGs), the objectives of the subject are aligned with the following: the following following:

- Goal 9: Industry, Innovation and Infrastructure.
  - Target 9.1. Develop reliable, sustainable, resilient and quality infrastructure, including regional and cross-border infrastructure , to support economic development and human well-being, with particularempphasis on affordable and equitable access for all.
- Goal 16: Promote just, peaceful and inclusive societies.
  - Target 16.5: Significantly reduce corruption and bribery in all its forms.

### 2. Learning results

To pass this subject, each student must demonstrate the following outcomes:

- RA1: Know and use with fluency the tools to retrieve information from digital sources (including browsers, search engines and catalogs)
- RA2: Know the basic operation of computers, operating systems and databases and performs simpleprograms on them.
- RA3: Use computer equipment effectively, taking into account its logical and physical properties.
- RA4: Know and use environments for program development.
- RA5: Analyze and generate solutions to information processing problems in the engineering world of low to medium complexity.

### 3. Syllabus

1. Introduction. Structure and functions of a computer. Computer hardware. Introduction to Systems Operational, application software of interest to the degree. Programming languages, compilers and interpreters.
2. Basic data types, operators and expressions. Data input and output (screen)
3. Control structures. Sequential, conditional and iterative composition. Procedures and functions.
4. Compound data types. Data structures. Vectors and matrices. Chains
5. Text files. Files with data separated by delimiter characters.

### 4. Academic activities

The teaching organization of the course is as follows:

- Lectures (2 hours per week). Total 30 hours.
- Problem classes (1 hour per week). Total 15 hours.
- Practical classes (2 hours each week). Total 30 hours.

These are programming work sessions, supervised by one or two teachers, in which students participate in small groups.

- Personal study. 60 hours
- Assessment tests. 4 hours.

## 5. Assessment system

The subject will be evaluated in the following modalities, dividing each session in two grades P1 and P2:

- P1. Written exam, in which each student has to solve problems and answer, if necessary, to conceptual questions . (70% of the grade, minimum 4 out of 10).
- P2. Practical part. (30% of the grade if the minimum is reached in P1). In the first call, it can be passed through the completion of activities during the teaching period (P2A) or through a global exam of practices (P2B). In the second call, this practical part can only be passed through the comprehensive practical exam (P2B).
  1. P2A. Deliveries and activities that are indicated during the teaching period. The practices not delivered will be weighted in the calculation of P2A as if their grade were 0.
  2. P2B. Practice exam, in which the student must individually perform a programming task on a computer within a preset time. The P2B rating is an alternative to the P2A rating.

In all cases, the correctness of the solution, quality, clarity and organization will be evaluated.

Only those who do not appear for the written examination will be considered as no-shows at the first call.

Those who do not take either the written exam nor the comprehensive exam in September will be considered as not having presented at the second call.