

25802 - Computer Science

Syllabus Information

Academic year: 2023/24

Subject: 25802 - Computer Science

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

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

ECTS: 6.0

Year: 1

Semester: 107-First semester

558-First semester o Second semester

271-First semester

Subject type: Basic Education

Module:

1. General information

The subject aims to make the student become an advanced computer user, so that they can efficiently use this tool and understand its basic operation.

It consists of two subject blocks. The first, of an introductory nature, presents a general overview of the world of informatics. In the second, basic knowledge of computer programming is worked on, to acquire a greater degree of understanding of the machine, and to learn computational thinking as a problem-solving technique.

Special emphasis is placed on the generation of optimized processes, both in terms of execution time and resources required for their execution. This approach is aligned with the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>), such that the acquisition of the learning results of the subject will contribute to some extent to the achievement of Objective 7.3 of Goal 7.

No previous knowledge is required to take the subject.

2. Learning results

1. Knowledge of the internal logical and physical structure of a computer.
2. Use of graphical and textual interfaces of various operating systems.
3. Skills to decide the best computer tool to use to perform a task, valuing the use of free software tools against other alternatives.
4. Efficient use of the Internet as a means of obtaining and retrieving information.
5. Skills to decide how to adequately represent information on the computer.
6. Ability to create the data structures associated with an information processing problem, within the framework of object-oriented programming
7. Understanding and critical analysis of relatively simple programs built by third parties.
8. Ability to apply the basic mechanisms of structured and object oriented programming to create correct programs that solve low to medium complexity information processing problems, using an object-oriented programming language.

3. Syllabus

Theory

- **Block I: Introduction to computer science**
 - Internal structure of a computer
 - Software
 - Operating systems
 - Hardware
 - Computer networks
 - Representation of information
 - Databases
- **Block II: Programming**
 - Programming basics
 - Algorithm and program design

Practices

- **Block I: Introduction to computer science**

- Computer tools (1)
- Computer tools (2)
- **Block II: Programming**
 - Program design (1)
 - Program design (2)
 - Program design (3)
 - Program design (4)

4. Academic activities

- **Master classes.** 30 hours
 - The contents of the subject are presented. The block II topics are eminently practical in orientation **Problem solving and case studies.** 10 hours
 - The solutions reached to proposed problems that have been solved in advance are presented and discussed **Laboratory practices.** 20 hours
 - Activities are proposed to be solved with the help of a computer **Teaching assignments.** 25 hours: 1 of tutorials and 24 of elaboration
 - Two individual papers, one in each block of the subject
 - An optional group work. It is associated with 1 hour of tutorials **Study hours.** 60 hours
- **Assessment** 5 hours

5. Assessment system

There are two evaluation modalities

- **Mixed assessment**
 - The following activities developed during the term will have the weight indicated in the grade of the subject.
 - **Practices** 15%
 - **Individual work:** 10%
 - **Examination of Block I:** 25%. Multiple choice test
 - The final written test consists of:
 - **Block I exam**, for students who have not passed the previous exam
 - **Examination of Block II:** 50%. Programming exercises
- **Simple evaluation**
 - 100% of the grade comes from a final written test, consisting of:
 - **Examination of Block I:** 25%. Multiple choice test
 - **Examination of Block II:** 75%. Programming exercises

The subject will be considered **passed** if:

- A minimum grade of **3.5** out of 10 is obtained **in both exams**
- The sum of the grades of the various tests and activities, according to the evaluation system chosen, weighted by their respective values, is greater than or equal to 5

Regardless of the evaluation modality chosen, the optional activity **Group work** will have a value of 1 point, which will be added to the grade obtained in case of having passed the subject.

The detection of plagiarism in any activity will result in the cancellation of the grades of all the activities developed during the term.