Academic Year/course: 2024/25

25802 - Computer Science

Syllabus Information

Academic year: 2024/25
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: 436-First semester o Second semester
107-First semester
Subject type: Basic Education
Module:

1. General information

This subject introduces the engineering student to problem solving using a computer as a tool. The objectives of the subject are basically twofold:

(1) To enable the student to approach the solution of a problem by creating simple programs, covering: the specification of the problem, the approach of a range of solutions as possible alternative algorithms, the choice of the best solution, and the translation of these solutions into programs executable by a computer in a general purpose programming language.

(2) The student should know the constituent elements of a computer, understand its basic operation, and be able to search for information and apply programming and troubleshooting skills to the tools and software applications available.

2. Learning results

- Possess ability to retrieve information (including browsers and search engines)
- Know the basic operation of computers, operating systems and databases and create simple programs on them
- Operate computer equipment effectively, taking into account its logical and physical properties.
- Correctly pose the problem from the proposed statement and identifies the options for its resolution. Apply the appropriate solving method and identify the correctness of the solution.

- Be able to specify, design and build simple computer systems.

3. Syllabus

- Basic concepts - computer structure, operating systems, networks, machine language, assembler, compilers (1.1); and introduction to programming (1.2).

2. Data types

- Basic concepts (2.1); the integer type (2.2); the real type (2.3); the boolean type (2.4); and the character type (2.5).

3. Composition schemes

- Sequential composition (3.1); conditional composition (3.2); and iterative composition (3.3)

4. Behavioral abstraction: Procedures and functions
5. Data abstraction: Compound data types

- Vectors (5.1); registers (5.2); and strings (5.3)

6. Files

- Sequential files (6.1); and text files (6.2)

4. Academic activities

- Lectures (30h): The professor will present, analyze and explain the concepts of the subject, illustrating them with examples.
- **Problem sessions** (15h): Teacher-guided problem solving.
- **Tutored practice sessions** (14h): Given a practice script, the students will have to work on solving the problems presented therein using a computer, with the assistance of a teacher.
- **Autonomous work in practices and project** (25h): With the possibility of attending tutorials if necessary, the students will have to solve the proposed problems.

- **Personal study** of the subject by the students and resolution of problems of increasing difficulty proposed by the teachers (60h).
- **Exams and** assessment (6h).

5. Assessment system

The proposed assessment activities are:

1. Practical work (15%).

2. Performance and oral exposition or defense of practical exercises (15%).

3. Written test (70%).

In order to pass the subject, a minimum weighted grade of 5/10 and a grade higher than 4/10 in each of the three parts must be obtained. In case of not obtaining the minimum grade required in any of the tests, the grade in the subject will be the lower value between the weighted average of the three tests and 4/10. If plagiarism is detected in any of these tests (1, 2 or 3), the grade for that test in the corresponding assessment (progressive or global) will be zero. In the case of the practical exercises (2), these can be considered a single test. In the event of alleged plagiarism or any other type of academic fraud, and in accordance with current regulations, a report will be drawn up and submitted to the institution's "Comision de Convivencia". The course will remain "Pending to be graded" until a resolution is reached by the competent body. If this happens during the progressive assessment phase, the student will be able to take the global assessment corresponding to that test.

Those students who have not taken tests 1 or 2 during the term (in progressive assessment), may pass the course by taking the global assessment tests corresponding to activities 1 and 2, which will be scheduled, together with the evaluation activity numbered 3, on the dates of the official exam calendar of the center (or on dates that will be announced well in advance if this is not possible due to logistical issues). Students who have passed activities 1 and 2 during the course (in progressive assessment) may apply for a higher grade on the dates of the global assessment of the corresponding call.

6. Sustainable Development Goals

8 - Decent Work and Economic Growth
9 - Industry, Innovation and Infrastructure