Universidad Zaragoza

Academic Year/course: 2024/25

30303 - Fundamentals of computer studies

Syllabus Information

Academic year: 2024/25
Subject: 30303 - Fundamentals of computer studies
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 581 - Bachelor's Degree in Telecommunications Technology and Services Engineering
ECTS: 6.0
Year: 1
Semester: First semester
Subject type: Basic Education
Module:

1. General information

The purpose of this subject is to enable the student to solve a problem by creating simple programs. Its core content is programming: problem specification, proposing solutions as algorithms, choosing the best solution based on experimentation, and translating solutions into programs executable by a computer in a programming language.

2. Learning results

- Develop the ability to express solutions as algorithms, and the role of algorithms in approaching areas such as system design, problem solving, simulation and modeling.
- Require a disciplined approach to problem solving, from which quality solutions are expected.
- Control the complexity of problems, first through abstraction and simplification, and then design solutions by integrating components.
- Facilitate understanding of the opportunities offered by process automation, and how people interact with computers.
- Facilitate learning, through experimentation, basic principles such as conciseness and elegance, as well as recognizing bad practices.

3. Syllabus

Computer: *Machine running Algorithms*. Notion of Algorithm**.** Computer structure: Digital Nature, coding, hardware, software. Operating systems. Databases. Programming: Programming styles, hierarchy of languages, programming elements. Computer networks.

Abstraction with Procedures. Data types and algorithmic composition schemes: Concept of data type.

Constants and variables. Basic data types: Boolean, character, integer, real. Control Structures**,** Procedures and Functions. Algorithm design techniques: Sequence processing (files and sequential search).

Abstraction with Data. Tables. Indexed Access. Ordination. Abstract Data Types: Modularity, objects and status.

4. Academic activities

The student's dedication to achieve the learning results in this subject is estimated in 150 hours, distributed as follows:

- 28 hours of theoretical and practical classes.
- 14 hours of problem-solving exercise classes.
- 18 hours of practical laboratory classes.
- 84 hours of work and effective individual study (study of notes and texts, problem solving, preparation of lectures and practicals, program development, etc.).
- 6 hours dedicated to different assessment tests.

5. Assessment system

Practical test (*25% of the grade)*. The sessions will consist of a series of exercises using the computer. Optionally, a student may submit during the semester, on the dates indicated by the professors, the designated exercises. A minimum grade of 5 in the deliveries will exempt you from taking the final practical test in the laboratory in the **first call**.

Written test *(75% of the grade)* in which problems to be solved by means of a computer will be presented. The quality and clarity of the resolution strategy will be valued, as well as its efficiency. The quality of the program, written in the general purpose programming language, will also be assessed. Serious semantic errors may result in a total penalty for the exercise.

In order to pass the course it is an essential condition to obtain a grade higher or equal to 5 points out of 10 in each of the two types of activities. The assessment of the subject in the **second call** will consist of **a single written test (100%)** where the knowledge and skills acquired will be evaluated.

6. Sustainable Development Goals

1 - End of Poverty
8 - Decent Work and Economic Growth
16 - Peace, Justice and Strong Institutions