Universidad Zaragoza

Academic Year: 2025/26

30204 - Programming I

Teaching Plan Information

Academic year: 2025/26
Subject: 30204 - Programming I
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel
Degree: 439 - Bachelor's Degree in Informatics Engineering
443 - Bachelor's Degree in Informatics Engineering
ECTS: 6.0
Year: 1
Semester: First semester
Subject type: Basic Education
Module: Materia básica de grado

1. General information

The objectives of Programming 1 are that the student knows the basic concepts related to programming; knows how to analyze concrete problems, solve them and develop programs that allow to obtain the corresponding results in a computer; and learn to use and become familiar with a technological environment for the development of programs.

2. Learning results

1. To know basic concepts related to programming and computer science.
2. Understand, analyze and solve low to medium complexity information processing problems and build algorithms to solve them.
3. Define the most appropriate data structures to represent the information associated with each problem.
4. Design top-down algorithmic actions that solve each problem effectively and efficiently.
5. Know basic problems and algorithms for the treatment of sequential and indexed data structures.
6. Know and understand the syntax and semantics of the basic constructs of a programming language.
7. Write programs with good style, proper documentation, accurate comments and correct specifications.
8. Know how to use editing, compilation, debugging and execution tools to develop programs.
9. Use strategies to correct programs when they do not work well.
10. To set up and run programs written in a given programming language on a computer.

3. Syllabus

I. Concepts and basic elements of programming

- Problems of information processing, algorithms and programs
- Programming languages and program execution
- Information, data, operations and expressions

II. Design of the first programs

- Design of some elementary programs
- Calculation problems with integers
- Modular and top-down program development
- Calculation problems with real numbers

III. Design of programs that work with data structures

- Indexed data structuring (vectors)
- Representation of character strings
- Aggregate data structuring (records)

IV. Design of programs that work with data stored in files

- Data input and output
- Working with text and binary files
- Working with files: other possibilities

V. Program design methodology

4. Academic activities

At the School of Engineering and Architecture (EINA) of the Ebro River Campus:

- Participatory lectures 26 hours
- Problem solving and case studies: 13 hours
- Computerized practices: 18 hours
- Study and personal work: 87 hours
- Assessment tests. 6 hours

At the Escuela Universitaria Politécnica de Teruel (EUPT) of the Teruel Campus:

- Participatory lectures 30 hours
- Computerized practices: 30 hours
- Study and personal work: 87 hours
- Assessment tests. 3 hours

5. Assessment system

First call. The assessment of the subject is based on the following tests:

- **P1.** Test in which each student must answer questions and solve exercises and problems. It may be required to be performed by working on the computer or in written form. A minimum grade of 5.0 points is required in this test to pass the subject. If this minimum score is obtained, the test is weighted 70% at EINA and 50% at EUPT. Otherwise, the grade for this test is the one that will be recorded in the minutes.
- **P2.** Computer programming work. These works are weighted in the grade of the subject by 30% in the EINA and 50% at EUPT. Each student must deliver the work of programming indicated in the practices within the deadlines established. When grading these papers, will evaluate their performance according to specifications, the quality of their design and presentation, the proper application of the resolution methods, the time spent, as well as the ability to explain and justify the design. The teacher will indicate whether the programming problems corresponding to the practices must be carried out individually or in teams.
- **P3.** Practical and individual programming exam. It weights as P2 and is an alternative global test to P2 for students who have not completed the P2 programming work or have not reached an adequate level of achievement. It will be up to each student to decide whether or not to sit for the P3 exam. Students who choose to sit the exam will irreversibly renounce the grade obtained in P2. In the practical exam each student will be given programming exercises of a similar nature to those performed in the practical or seen in class, which must be solved on a computer within a preset time. It will be graded with a score from 0 to 10, for which the correct functioning and performance of the programs according to specifications, the quality of their design and the adequate application of the resolution methods will be evaluated.
- **Tests on a voluntary basis.** Throughout the term there will be several voluntary tests consisting in the resolution of questions, exercises and programming problems. 10% of the grade of these tests, i.e., between 0 and 1 point, will be added to the grade obtained by each student with P1 and P2/P3 in the first call (not in the second call), provided that such grade is equal to or higher than 5.0.

Second call. The assessment of the subject is based on tests analogous to P1 and P3 of the first call, with the same weightings and minimum grade requirements. The student's grades obtained in the first call in any of the tests (P1 and P2/P3) are

maintained in the second call, unless the student chooses to take the corresponding test in this new call, in which case the new grade will prevail.

6. Sustainable Development Goals

9 - Industry, Innovation and Infrastructure