29804 - Fundamentals of computer studies

Syllabus Information

Academic year: 2023/24
Subject: 29804 - Fundamentals of computer studies
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel
Degree: 440 - Bachelor's Degree in Electronic and Automatic Engineering
       444 - Bachelor's Degree in Electronic and Automatic Engineering
ECTS: 6.0
Year: 1
Semester: 440-First semester o Second semester
107-First semester
444-First semester
Subject type: Basic Education
Module:

1. General information

The objectives of the subject are basically of two types:

- To enable students to solve a problem by creating simple programs. Therefore its basic and core content is programming and, in particular, the specification of problems, the approach of a range of solutions as possible alternative algorithms, the choice of the best solution based on experimentation or previous experience, and the translation of these solutions into programs executable by a computer in a general purpose programming language.

- That the students know the constituent elements of a computer, understand its basic operation, be able to search for information and apply the knowledge of programming and problem solving in the available software tools and applications.

These approaches and objectives are aligned with some of the Sustainable Development Goals, SDGs, of the 2030 Agenda, such as target 1.4 of goal 1, and target 16.5 of goal 16.

2. Learning results

The student, in order to pass this subject, must demonstrate the following results...

- Ability to retrieve information (including browsers, search engines and catalogs).

- 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.

- Use ranges for program development.

- Understand, analyze and propose solutions to information processing problems in the engineering world, of low to medium complexity

- Specify, design and implement correct programs for problem solving.

3. Syllabus

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Syllabus of the subject:

- Basic computer concepts.

- Basic programming concepts.

- Introduction to OOP.

- Classroom Design.

- Indexed Data Structures.

- Structured operations with arrays.

- Exceptions and files.

Laboratory practice program:
- Operating Systems. Command line.
- Editing, compilation and execution. Integrated programming environment.
- Simple data. Sequential and conditional scheme.
- Iterative Scheme.
- Classroom design (I).
- Classroom design (II).
- Arrays and Strings.
- Multidimensional arrays.
- Binary data files.
- Text Files.

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Syllabus of the subject:
- Introduction to Computer Science and programming.
- Basic elements of the C language.
- Control structures.
- Functions.
- Structured data types.
- Input/Output.

Laboratory practice program:
- Variables, constants, data types, expressions and operators. Input/Output Instructions.
- Control Structures.
- Functions, Strings, Vectors and Matrices.
- Structured Data Types, Pointers and Files.

4. Academic activities

The program offered to the student includes the following activities:
- Lectures (30 horas): Presentation of the contents of the subject by the teachers.
- Problem classes (10 hours): Solving problems posed in class.
- Computer practices (20 hours): Development of practices by the students, guided by the teachers, which develop the theoretical knowledge.
- Works (24 hours): Development of simple programs of increasing difficulty proposed by teachers.
- Study (60 hours).
- Assessment tests (6 hours)

It should be noted that the course has both a theoretical and practical orientation. Therefore, the process of learning emphasizes the student's attendance to lectures, as well as the performance of laboratorypractices , the realization of simple programs of increasing difficulty, and individualized study.

5. Assessment system

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The possible EVALUABLE ACTIVITIES in this subject are the following:

Practical work in the laboratory. The solutions implemented for the exercises will be evaluated, according to the quality of the resolution strategy and of the program that implements such strategy. For this activity, dates will be proposed for the delivery of the work done, assuming that the non-delivery of the same is equivalent to the waiver of the grade they imply.

Development and defense of **programming projects.** The ability to solve programming problems of medium-high complexity

will be evaluated. This optional activity will be tutored and supervised and will have a deadline.

3. **Individual written test** (exam) in which questions and problems in the field of engineering will be posed to be solved by means of a computer, of a similar type and level of complexity to that used during the term. In the qualification of this activity, minimum score values will have to be obtained in its constituent parts so that this qualification can be averaged with the qualifications of the rest of the activities.

4. **Volunteer work**. On various topics related to the subject and/or the degree, they may represent an additional valuationin the final grade of up to 1 point out of 10, depending on their quality and extension.

5. **Laboratory examination**. Those students who, for whatever reason, have not carried out the activity in section 1 (practical laboratory work), will be able to access the grade for this activity by means of the completion of a laboratory test, upon express request to the teacher and under the conditions explained below in this section.

On the other hand, the student will be able to choose between the following **ASSESSMENT SYSTEMS**:

1. **Normal assessment system**: This assessment system will take into account the grades obtained in the evaluable activities 1 and 3. In this case, the grade of the individual written test (activity 3) represents 75% of the final grade and comes from the final exam of one of the two official examination calls. The grade for the practical laboratory work (activity 1) represents 25% of the final grade and, with this assessment system, is not required to have any minimum value. The subject is passed with an overall grade of 5 points out of 10..

2. **Continuous assessment system** Students who wish to do so may opt for a continuous assessment system that will allow them to pass the subject before the date of the first official exam. For this purpose, the student body must comply with a series of commitments whose non-compliance will result in not being evaluated in this way and will be evaluated through the normal assessment system. The continuous assessment system will consist of:

- Completion of the evaluable activities 1 and 2 described above, with fixed deadlines and with minimum quality and scoring requirements.
- Completion of individual written tests (2 midterm exams) during the term period, with minimum grades required.
- The percentage valuation of each part, for the final grade of the subject, will be as follows: 25% laboratory work (activity 1), 25% programming projects (activity 2) and 50% individual written tests. The subject is passed with a total grade of 5 points out of 10 .

Global assessment system: For this assessment system, evaluable activities 3 and 4 will be taken into consideration

5. The overall test in this subject will consist of the test described in activity 3 and an exam on the following questions

practical laboratory work (activity 5) for those students who have not done the laboratory practices (activity 1) and want to acquire the corresponding grade (it must be requested at least 48 hours before the exam of the official call in order to be able to do it). In this case, the grade of the individual written test (activity 3) represents 75% of the final grade and comes from the final exam of one of the two official examination calls. The grade of the laboratory exam (activity 5) is 25% of the final grade. Regarding the minimum requirements, in this evaluation system it will be taken into account that at least 5 points out of 10 must be obtained in the individual written test and at least 5 points out of 10 in the practical laboratory work exam in order to pass. In case these requirements are not met, the total grade for the subject will be the lower of the two grades.

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The **ASSESSMENT ACTIVITIES** in this subject are the following:

- Practical work in the laboratory (25%)
- Completion and defense of a Programming Project (25%)
- Individual written test (50%)

The subject is passed with a total grade of 5 points out of 10, and it is required to obtain at least a 4 in each of the activities. If these requirements are not met, the total grade will be the lower grade of the parts.