29902 - Fundamentals of computer studies

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview
The learning process that is designed for this course is based on:
- T he presentation of the contents of the course in lectures
- Analyzing and solving case studies in class.
- Personal study of the subject by students .
- The design and implementation of lab exercises by students , guided by teachers, in the computer laboratory .
- The development of simple programs of increasing difficulty proposed by the teachers as homeworks

Keep in mind that the course has both theoretical and practical orientation . Therefore, the learning process emphasizes

both student attendance at lectures , as in the experiments in the laboratory, performing simple programs of increasing difficulty, and individualized study .

5.2.Learning tasks

The program is offered to the student in order to help him / her to achieve the intended learning outcomes, and includes the following activities ...

- In classes taught in the classroom, the program of the course will be developed .
- In classes of case studies , problems will be solved illustrating the concepts and techniques presented in the lectures
- In the laboratory sessions, problems of information processing will be solved designing and implementing programs running in a computer

5.3.Syllabus

The course program is organized into the following three blocks:

1. **Computer: A machine for the execution of algorithms.**
   Notion of Algorithm.
   Structure of the computer: Digital nature, coding, hardware, software.
   Operating systems.
   Databases.
   Programming: Programming Styles, Hierarchy of languages, Programming elements.
   Computer networks
2. **Abstraction with procedures.**
   Data types and algorithmic composition schemes:Data type concept.
   Constants and variables.
   Basic data types: Boolean, character, integer, real.
   Control structures, procedures and functions.
   Algorithm Design Techniques. Treatment of Sequences (sequential files and search). Recursion.
3. **Data abstraction.**
   Tables.
   Indexed access.
   Sorting algorithms as an example.
   Abstract Data Types: Modularity, objects and state.
   Introduction to Object Oriented Programming.
   Introduction to techniques of object-oriented design.

The concepts, methods and tools of the above paragraphs are illustrated through examples, as realistic as possible, within the fields of chemical engineering, covering aspects such as: performing mathematical calculations, treatment of non-numerical information, simulation, etc.

5.4.Course planning and calendar

Scheduling of the sessions and presentation of works
The schedule of the course will be defined by the School in the academic calendar of the corresponding academic year.

5.5.Bibliography and recommended resources

BB	Desarrollo de algoritmos y técnicas de programación en Pascal / Cristobal Pareja Flores...[et al.] . - [1a. ed.] Madrid : RA-MA, 1997
BC	Leestma, Sanford. Programación en

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