30105 - Fundamentals of computer studies

Información del Plan Docente

Academic Year	2016/17
Academic center	175 - Escuela Universitaria Politécnica de La Almunia 179 - Centro Universitario de la Defensa - Zaragoza
Degree	425 - Bachelor's Degree in Industrial Organisational Engineering 563 - Bachelor's Degree in Industrial Organisational Engineering 457 - Bachelor's Degree in Industrial Organisational Engineering
ECTS	6.0
Course	
Period	Half-yearly
Subject Type	Basic Education
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The learning process designed for this subject is based on the folowing:

Specialization in business

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The subject is strongly based on practice, so it has many practical work in classes.

The organization of teaching will be carried out using the following steps:

- **Theory Classes** : Theoretical activities carried out mainly through exposition by the teacher, where the theoretical supports of the subject are displayed, highlighting the fundamental, structuring them in topics and or sections, interrelating them.
- **Practical Classes** : The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.
- **Laboratory Workshop** : The lecture group is divided up into various groups, according to the number of registered students, but never with more than 20 students, in order to make up smaller sized groups.
- **Individual Tutorials** : Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online.

Defence profile

All the activities that are included in the course in a daily basis are considered for the final evaluation. Therefore, the evaluation of the course is done in a continuous manner through several or all of these elements: exercises, participation, lab sessions, projects, tests and final exam.

5.2.Learning activities

The programme offered to the student to help them achieve their target results is made up of the following activities..

Specialization in business

Face-to-face generic activites:

- **Theory Classes:** The theoretical concepts of the subject are explained and illustrative examples are developed as support to the theory when necessary.
- **Practical Classes:** Problemas and practical classes are carried out, complementary to the theoretical concepts studied.
- **Laboratory Workshop:** This work is tutored by a teacher, in groups of no more than 20 students.

Generic non-class activities

- Study and understanding of the theory taught in the lectures.
- Understanding and assimilation of the problems and practical casses solved in the practical classes.
- Solving proposed problems, project, etc.
- Preparation of laboratory workshops, preparation of summaries and reports.
- Preparation of the writen tests for continuous assessment and final exams.

Defence profile

The different activities programed during the course (exercises, lab sessions, etc.) are used in all the parts of the program in order to achieve the specific objectives of Fundamentals of Computer Science and some general objectives of the degree.

5.3.Program

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The subject program is structurated around two complementary components

- Theory
- Practice

1-Theoretical contents

Part I

- Computer: Machine that executes algorithms. Algorithm definition. Computer architecture: digital nature, codification, hardware, software.
- Operating systems.
- Data bases
- Programming: programming styles, language hierarchy, programming elements
- Nets of computers.

Part I

- Abstraction with procedures. Data types and algorithmic compund. Data type concept.
- Constants and variables. Basic data types: boolean, char, integer, double.
- Control structures. Procedures and functions.
- Technics of algithmic design: I/O flows.

Part III

- Data abstraction. Introduction to classes and objects
- Tuples. Tabular.
- Indexed access. Sort
- Files
- Abstract data types

Part IV

- Classes, objects and methods

2-Practical contents

Every part has related practices. As the concepts are showed, the practices are going to be presented, in classroom or in moodle platform.

Practice 1	**First program. Use of variables and constants. Discriminate uses of different data types and show the hep provided by a language with a strict data type definition. Ty pe conversions.**

Practice 2	**Build algorithms I.**
Practice 3	**Build algorithms II.**
Practice 4	**Uso of tables and attributes.**
Practice 5	**Algorithms with data structures.**
Practice 6	**File use. Serialization.**

Defence profile

The program of the course includes the next topics:

1. Computer architecture, hardware and software.
2. Languages and programming interface.
3. Predefined data types.
4. Modular programming I (procedures).
5. Control structures (conditional sentences and loops).
6. Modular programming II (functions).
7. Error control and files.
8. Advanced data types I (records).
9. Advanced data types II (vectors and matrices).
10. Algorithms on vectors (insertion, removal, sort and search).

5.4.Planning and scheduling

Specialization in business

The subject has 6 ECTS credits, which represents 150 hours of student work in the subject during the trimester, in other words, 10 hours per week for 15 weeks of class.

A summary of a weekly timetable guide can be seen in the following table.

Activity	Weekly school hours
Lectures	3

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Laboratory workshop	1
Other activities	6

Nevertheless the previous table can be shown into greater detail, taking into account the following overall distribution:

- 42 hours of lectures, with 40% theoretical demostration and 60% solving type problems.
- 16 hours of laboratoy workshop, in 2 hour sessions.
- 2 hours of wirtten assessment tests, one hour per test.
- 45 hours of exercices and tutelated work, divided up the 15 weeks of the second semester.
- 45 hours of personal study, divided up the 15 weeks of the second semester.

There is a tutorial calendar timetable set by the teacher taht can be requested by the students who want a tutorial.

The dates of the final exams will be those that are officially published at

http://www.eupla.es/secretaria/academica/examenes.html.

The final project are due at last week.

Defence profile

During the semester there will be a series of activities like exercises, lab sessions, projects, tests, etc. After the semester, there will be an exam including theory and practice.

The projects will be conducted in teams of 2 persons and they will be submitted online before a due date. It will be the authors' responsibility to comply with the deadline and to include the authorship details in the files that were submitted.

5.5.Bibliography and recomended resources

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- Design patterns : Elements of reusable object-oriented software / Erich Gamma...[et al.] . - 15th. pr. Reading, Massachusetts : Addison-Wesley, 1998
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- Fowler, Martin. UML distilled :applying the standard object modeling language / Martin Fowler with Kendall Scott. - 1ª edición Reading, Massachusetts [etc.] : Addison-Wesley Longman, 1997