

30105 - Fundamentals of computer studies

Información del Plan Docente

Academic Year	2017/18
Faculty / School	175 - Escuela Universitaria Politécnica de La Almunia 179 - Centro Universitario de la Defensa - Zaragoza
Degree	425 - Bachelor's Degree in Industrial Organisational Engineering 457 - Bachelor's Degree in Industrial Organisational Engineering 563 - Bachelor's Degree in Industrial Organisational Engineering
ECTS	6.0
Year	
Semester	Half-yearly
Subject Type	Basic Education
Module	---

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 designed for this subject is based on the following:

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30105 - Fundamentals of computer studies

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 tasks

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

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Face-to-face generic activities:

- **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 written 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.Syllabus

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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 II

- Introduction
- Function design
- Text and input/output
- Conditional branching
- Introduction to classes and objects
- Lists
- Iteration

Part III

- Other collections: sets, tuples, dictionaries
- Designing algorithms
- Search and sorting
- Files

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.

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.

30105 - Fundamentals of computer studies

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.Course planning and calendar

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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.

- 3 hours of lectures
- 1 hour of laboratory workshops
- 6 hours of other activities

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

- 42 hours of lectures, with 40% theoretical demonstration and 60% solving type problems.
- 16 hours of laboratory workshop, in 2 hour sessions.
- 2 hours of written assessment tests, one hour per test.
- 45 hours of exercises 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.

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 recommended resources

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Updated bibliography is in <http://psfunizar7.unizar.es/br13/eBuscar.php?tipo=a>

There not exists bibliography

30105 - Fundamentals of computer studies

URLs LISTING:

How to Design Programs, Second Edition
Matthias Felleisen, Robert Bruce Findler,
Matthew Flatt, Shriram Krishnamurthi MIT
Press Creative Commons CC BY-NC-ND
license -
[<http://www.ccs.neu.edu/home/matthias/HtDP2e/index.html>]
Think Python. How to Think Like a
Computer Scientist 2nd edition by Allen B.
Downey Green Tea Press Creative
Commons Attribution-NonCommercial 3.0
Unported License -
[<http://greenteapress.com/wp/think-python-2e/>]

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- BB** Desarrollo de algoritmos y técnicas de programación en Pascal / Cristobal Pareja Flores...[et al.] . - [1a. ed.] Madrid : RA-MA, 1997
- BB** Valls Ferrán, José María. Programación estructurada y algoritmos en PASCAL / José María Valls Ferrán, David Camacho Fernández . - [reimp.] Madrid : Pearson Educación, D.L. 2010
- BC** Leestma, Sanford. Programación en Pascal / Sanford Leestma, Larry Nyhoff ; traducción, Natalia López, Fernando Rubio, Clara M^a Segura ; revisión técnica, Sebastián Dormido Bencomo . - 4^a ed. en español, reimp. Madrid : Pearson Educación, 2006
- BC** Prieto Espinosa, Alberto. Introducción a la informática / Alberto Prieto Espinosa, Antonio Lloris Ruiz, Juan Carlos Torres Cantero . - 4^a ed. Madrid [etc.] : MacGraw-Hill, D.L. 2006

ONLINE

VAN CANNEYT, Michaël, FreePascal -
Language reference guide, -
[<ftp://ftp.freepascal.org/pub/fpc/docs-pdf/ref.pdf>]