25802 - Computer Science

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	558 - Bachelor's Degree in Industrial Design and Product Development Engineering 271 - Bachelor's Degree in Industrial Design and Product Development Engineering
ECTS	6.0
Course	---
Period	Indeterminate
Subject Type	Basic Education
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

Each subject/course timetables, starting and ending dates, teaching schedules and teachers' office hours are published and can be found at EINA website:

https://eina.unizar.es/

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

BASIC COMPETENCES

CB01. Students have demonstrated knowledge and understanding in a field of study that is part of the general secondary education curricular, and is typically at a level which, although it is supported by advanced textbooks, includes some aspects that involve knowledge of the forefront of their field of study.

CB02. Students can apply their knowledge to their work or vocation in a professional manner and have competences typically demonstrated through devising and defending arguments and solving problems within their field of study.

CB03. Students have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include an important reflection on social, scientific or ethical issues.

CB04. Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.

CB05. Students have developed those skills needed to undertake further studies with a high degree of autonomy.

GENERAL COMPETENCES

GC04. Ability to organize time effectively and coordinate activities to acquire new knowledge quickly and perform under pressure.

GC06. Ability to generate the necessary documentation for the proper transmission of ideas through graphics, reports and technical documents, models and prototypes, oral presentations in Spanish and other languages.

GC07. Ability to use and master techniques, skills, tools and techniques and communication and others specific of design engineering needed for design practice.

GC08. Ability to learn continuously, to develop autonomous learning strategies and to work in multidisciplinary groups with motivation and determination to achieve goals.

SPECIFIC COMPETENCES

SC03. Basic knowledge of the use and programming of computers, operating systems, databases and software with applications in Engineering in Industrial Design and Product Development.

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The course is composed of two blocks:

- Block 1 (Overview of Computer Science): It introduces the constituents of a computer and their functioning. The methodology applied is based on lectures.
- Block 2 (Programming): The goal is the student's skill to solve problems by writing computer programs. The methodology applied is based on problem-based learning.

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5.2.Learning activities

1 Theory classes. 35 presential hours.

- Theory classes of block 1 are lectures whereby the teacher presents the structure of a computer and its functioning.
- Theory classes of block 2 are based on example problems which are solved on the board by the teacher and students working together.

2 Problem classes. 10 presential hours.

The teacher poses a collection of problems to be solved by the students working individually or in groups.

3 Computer lab sessions. 15 presential hours.

The students carry out the proposed activities working with a computer.

- Computer lab sessions of block 1 are dedicated to learn how to work with several operating systems and software tools related to industrial design.
- Computer lab sessions of block 2 are dedicated to learn programming using an integrated development environment related to the programming language employed.

4 Individual Works. 15 non-presential hours.

The student has to do an individual work in each block of the course, which shall be submitted before the corresponding deadline. Work of block 1 consists in a technical slide show related to computer hardware, whereas work of block 2 it is to solve a programming problem.

5 Group Work. Optional. 1 semi-presential hour and 14 non-presential hours.

Optionally, groups of 2 or 3 students may request a work. It consists in a medium-complexity problem which has to be solved writing a computer program.

This activity is highly recommended to reach a medium-high level of programming skill. Semi-presential hours are tutorial support hours in which the teacher supervises the work.

5.3.Program

Theory Program

Block 1: Overview of Computer Science

1.- Computer Organization and Architecture

2.- Software

3.- Operating Systems

4.- Hardware

5.- Computer Networks

6.- Information Representation

7.- Databases

Block 2: Programming

8.- Basic Elements of Programming

9.- Algorithms and Programs Design

Practices program

Block 1: Overview of Computer Science

1.- Operating Systems: Windows and Linux

2.- Relational Databases

3.- Software Tools

Block 2: Programming

4.- First Steps in Programming

5.- Execution Control Instructions

6.- Collections

7.- More Items

5.4.Planning and scheduling

The course is estimated to take 150 hours of student effort:

60 presential hours:

- 45 blackboard hours (35 theory and 10 problem classes): 3 hours a week
- 15 computer lab hours: 2 or 2.5 hour sessions, about on alternate weeks

1 semi-presential hour: Tutorial support of group work

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89 non-presential hours:

- 15 hours in individual works
- 14 hours in group works
- 55 hours of study
- 5 hours of exams

5.5.Bibliography and recomended resources

RECOMMENDED BIBLIOGRAPHY

BB	Barnes, David J.. Programación orientada a objetos con Java usando BlueJ / David J. Barnes, Michael Kölling . - 5ª ed. Madrid : Pearson Educación, D. L. 2013
BC	Beekman, George. Introducción a la informática / George Beekman ; traducción, José Manuel Díaz Martín . - 6ª ed. Madrid : Pearson Educación, cop. 2005
BC	Prieto Espinosa, Alberto. Introducción a la informática / Alberto Prieto Espinosa, Antonio Lloris Ruiz, Juan Carlos Torres Cantero . - 4ª ed. Madrid [etc.] : MacGraw-Hill, D.L. 2006

LISTADO DE URLs:

Learning the Java Language - [http://docs.oracle.com/javase/tutorial/java]