

## 27003 - Computer Science I

### Información del Plan Docente

Academic Year	2017/18
Faculty / School	100 - Facultad de Ciencias
Degree	453 - Degree in Mathematics
ECTS	9.0
Year	1
Semester	First semester
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**

This course is aimed to introduce the students with no prior programming experience to practical skills for a computational approach to problem solving. The logical aptitude required for a mathematics student is a good passport to successfully grasp the modes of thinking involved in computer programming.

This course provides an introduction to the C programming language. It will be used CodeBlocks as the IDE for the practical lessons and the house work exercises.

#### **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 for this subject is designed with the following elements:

- Theoretical sessions with gradual presentation of the matter to the entire group.
  - Practical sessions where the explained theory is applied in the resolution of problems.
  - Laboratory sessions in small groups where different problems will be implemented in machine.
  - Personal work that can be made explicit by contributing to the blog of the subject.
  - Group work performed during the course that will be made explicit by the construction of a wiki.
- In either case, the main learning method used in this course will be the problem-based learning.

### 5.2. Learning tasks

To help to achieve the expected results the following activities are offered to the student:

- Theoretical, practical and laboratory sessions scheduled in the official calendar.
- Tutorial sessions to determine at the beginning of the course.
- General bibliography, and the wikis and blog of the subject accessible 24/7 from everywhere.
- Personal work where students can show their creativity in classroom and in the the blog of the subject.
- Group work where students can jointly contribute with their personal initiative to the construction of a wiki.

### 5.3. Syllabus

#### 1. Programming Fundamentals :

- Binary representation
- Algorithms and Programs
- Programming Languages: C Language case

#### 2. Data types, Variables and Constants

#### 3. Decision Making and Loops

#### 4. Pointers

#### 5. Arrays: Vectors, Matrices and Strings

#### 6. Subprograms: Functions

#### 7. Registers: Structures

#### 8. Files I/O

#### 9. Design of C Programs

### 10. Recursion

### 11. Search and Sorting Algorithms

## 5.4.Course planning and calendar

The planning of the lessons will follow the linear sequence proposed in the Program of section 5.3.

Each of these thematic units will take in average 1.5 weeks of explanation.

Every one of them is also associated with the corresponding laboratory practice.

To carry out this program the following scheduling is available:

Theoretical sessions of 2.5 hours per week.

Practical sessions of 1.5 hours weekly problems.

Laboratory sessions 2 hours per week.

Personal and group works should be submitted as described in point 1 in the 'Activities and key dates for the course'.

## 5.5.Bibliography and recommended resources

- Problemas resueltos de programación en lenguaje C / Félix García Carballera...[et al.] . - 1ª ed., 2ª reimp. Madrid : Thomson, 2004
- Kernighan, Brian W.. El lenguaje de programación C / Brian W. Kernighan, Dennis M.Ritchie ; traducción, Nestor Gómez Muñoz ; revisión técnica, David Frid . 2a. ed. México [etc.] : Prentice-Hall Hispanoamericana, cop.1991
- Schildt, Herbert. C manual de referencia / Herbert Schildt ; traducción Luis Hernandez Yañez ; revisión técnica Antonio Vaquero Sanchez . - 4a. ed. Madrid [etc.] : Osborne McGraw-Hill, D.L. 2000
- Llanos Ferraris, Diego Rafael. Fundamentos de informática y programación en C / Diego R. Llanos Ferraris . Madrid : Paraninfo, 2010
- Cerrada Somolinos, José Antonio. Fundamentos de programación / José A. Cerrada Somolinos, Manuel E. Collado Machuca . Madrid : Editorial universitaria Ramón Areces : UNED, D.L. 2010
- García-Bermejo, J.R.. Programación estructurada en C. Pearson