27003 - Computer Science I

Syllabus Information

Academic Year: 2020/21
Subject: 27003 - Computer Science I
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.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.

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

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

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as theory sessions, problem-solving sessions, laboratory sessions, autonomous work and study and group work.

4.2.Learning tasks

This course is organized as follows:

- **Theory sessions**. 2.5 weekly hours. The teacher explains the theory contents to the entire group.
- **Problem-solving sessions**. 1.5 weekly hours. In these sessions, the already explained theory is applied for the resolution of problems.
- **Laboratory sessions**. 2 weekly hours. In small groups where different problems will be implemented in machine.
- **Tutorials**. To set at the beginning of the course.

- **Autonomous work and study**. where students can show their creativity in classroom and in the the blog of the course.

Group work. Where students can contribute together with their personal initiative to the elaboration and presentation of a work in the classroom.

The teaching and evaluation activities will be carried out in person unless, due to the health situation or emergency, the guidelines issued by the competent authorities and by the University of Zaragoza arrange to carry them out electronically.

4.3.Syllabus

This course will address the following topics:

- **Topic 1. Programming Fundamentals**
  - Binary representation
  - Algorithms and Programs
  - Programming Languages: C Language case
- **Topic 2. Data types, Variables and Constants**
- **Topic 3. Decision Making and Loops**
- **Topic 4. Pointers**
- **Topic 5. Arrays: Vectors, Matrices and Strings**
- **Topic 6. Subprograms: Functions**
- **Topic 7. Registers: Structures**
- **Topic 8. Files I/O**
- **Topic 9. Design of C Programs**
- **Topic 10. Recursion**
- **Topic 11. Search and Sorting Algorithms**

4.4.Course planning and calendar

Each topic of the syllabus will take 1.5 weeks of explanation in average. Every topic is also associated with the corresponding laboratory practice.

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the Faculty of Sciences website and Moodle.

4.5.Bibliography and recommended resources

- Problemas resueltos de programación en lenguaje C / Félix García Carballeira...[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

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