Universidad Zaragoza

Academic Year/course: 2022/23

27003 - Computer Science I

Syllabus Information

Academic Year: 2022/23
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. CodeBlocks will be used as the IDE for the practical lessons and the house work exercises.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/es/), in such a way that the acquisition of the learning outcomes of the module provides training and competence to contribute to some extent to their achievement: (4) Quality education, (5) Gender equality, (8) Decent work and economic growth, (9) Industry, innovation and infrastructure, (10) Reducing inequality, (17) Partnerships for the goals.

2. Learning goals

3. Assessment (1st and 2nd call)

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.

Students are expected to participate actively in the class throughout the semester.

Classroom materials will be available online via OneDrive or Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials.

Further information regarding the course will be provided on the first day of class.

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 and group work and study** where students can show their creativity in classroom and in the different individual or group activities during the course.

The teaching activities and assessment tasks will take place in a face-to-face mode, except in the case that, due to the health situation, the dispositions emitted by the competent authorities and by the University of Zaragoza compel to take them to a greater or lesser extent in a telematic form.

4.3. Syllabus

- **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. 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 OneDrive or 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.
- Apuntes y materiales de la asignatura online y en OneDrive, R. López, 2020.

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=27003