Universidad Zaragoza

Academic Year/course: 2021/22

30213 - Data and Algorithm Structures

Syllabus Information

Academic Year: 2021/22
Subject: 30213 - Estructuras de datos y algoritmos
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel
Degree: 439 - Bachelor's Degree in Informatics Engineering
443 - Bachelor's Degree in Informatics Engineering
ECTS: 6.0
Year: 2
Semester: First semester
Subject Type: Compulsory
Module:

1. General information

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. The learning process that is designed for this subject is based on the following:

- The study and work continued since the first day of class.
- Learning concepts and methodologies for the design and implementation of correct, reusable and efficient Abstract Data Types (ADTs) through lectures, in which student participation will be encouraged.
- The application of such knowledge to the design and analysis of algorithms and programs in the classes of problems. In these classes, students will play an active role in the discussion and resolution of problems.
- Labs in which the student will implement several programming projects, applying the concepts and techniques explained in the lectures.
- Teamwork whose result will be reflected in the delivery of suitably designed and documented resulting programs, as well as the explanation and justification of the design and decisions adopted.
- A continued work combining concepts and analysis understanding, problem-solving sessions using "pencil and paper", and the set-up of (small or medium size) programming projects.

4.2. Learning tasks

The course includes the following learning tasks:

Classes of problems to apply the concepts and techniques previously presented.
The practice sessions take place in a computer lab. In these sessions, students will work in teams and perform a number of programming jobs directly related to the topics studied in the course. A series of works or programming exercises will be proposed to be developed either in the laboratory or at home. The result of this work will be delivered within fixed deadlines.

4.3. Syllabus

The course will address the following topics:

1. Programming with Abstract Data Types (ADTs).
2. Linear ADTs.
3. Tree ADTs.
4. Dictionaries and hash tables.
5. Introduction to algorithmic schemes.
6. Introduction to graphs.

4.4. Course planning and calendar

Classroom:

- Theoretical classes (2 hours per week)
- Classes of problems (1 hour weekly)

Labs:

There will be a first two-hour session in the laboratory. In the rest of the (off-site) practices, students will work in teams, tutored by a teacher. Programming projects will be performed and presented as specified for each of them, and within deadlines to be announced.

Student Work:

The dedication of the student to achieve the learning outcomes in this subject is estimated at 150 hours distributed as follows:

- 47 hours, approximately, of classroom activities (lectures, problems and laboratory face practices)
- 40 hours of programming teamwork
- 63 hours of effective personal study

4.5. Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30213