Universidad Zaragoza

Academic Year/course: 2022/23

30213 - Data Structures and Algorithms

Syllabus Information

Academic Year: 2022/23
Subject: 30213 - Data Structures and Algorithms
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.
- The teamwork developed to solve a proposed problem based on what has been done in the Labs and whose result is reflected in the delivery of the resulting program conveniently designed and documented.

In summary, 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:

- In the classes taught in the classroom, the syllabus of the subject will be developed.
- 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.

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 graphs.
6. Introduction to algorithmic schemes.

4.4. Course planning and calendar

In Zaragoza:

The planned teaching organization of the subject is as follows:

- Theoretical classes (2 hours per week).
- Classes of problems (1 hour per week).
- Lab classes (2 hours every two weeks).

Student Work:

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

- 30 hours of theoretical classes
- 15 hours of problem classes
- 15 hours of Lab classes
- 24 hours of programming work to complete Lab tasks
- 60 hours of effective personal study (study of notes and texts, problem solving, preparation of classes and practices)
- 6 hours of exams

The exam schedule and the date of delivery of work will be announced well in advance.

In Teruel:

The planned teaching organization of the subject is as follows:

- Theoretical classes (2 hours per week).
- Classes of problems (1 hour per week + 5 hours distributed throughout the semester).
- Lab classes (2 hours every two weeks up to a maximum of 5 sessions per group).

Student Work:

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

- 30 hours of theoretical classes
- 20 hours of problem classes
- 10 hours of Lab classes
- 24 hours of programming work to complete Lab tasks
- 60 hours of effective personal study (study of notes and texts, problem solving, preparation of classes and practices)
- 6 hours of exams

The exam schedule and the date of delivery of work will be announced well in advance.

4.5. Bibliography and recommended resources

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