

## 30213 - Data and Algorithm Structures

### Información del Plan Docente

<b>Academic Year</b>	2016/17
<b>Academic center</b>	110 - Escuela de Ingeniería y Arquitectura 326 - Escuela Universitaria Politécnica de Teruel
<b>Degree</b>	439 - Bachelor's Degree in Informatics Engineering 443 - Bachelor's Degree in Informatics Engineering
<b>ECTS</b>	6.0
<b>Course</b>	2
<b>Period</b>	First semester
<b>Subject Type</b>	Compulsory
<b>Module</b>	---

### **1.Basic info**

#### **1.1.Recommendations to take this course**

#### **1.2.Activities and key dates for the course**

### **2.Initiation**

#### **2.1.Learning outcomes that define the subject**

#### **2.2.Introduction**

### **3.Context and competences**

#### **3.1.Goals**

#### **3.2.Context and meaning of the subject in the degree**

#### **3.3.Competences**

#### **3.4.Importance of learning outcomes**

### **4.Evaluation**

### **5.Activities and resources**

#### **5.1.General methodological presentation**

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

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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 using "pencil and paper", and the set-up of (small or medium size) programming projects.

### 5.2.Learning activities

Lectures in the classroom where the contents of the course 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. Result of this work will be delivered within the fixed deadlines.

### 5.3.Program

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.

### 5.4.Planning and scheduling

#### Classroom:

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

#### Labs:

There will be a first face two-hour session in the laboratory. In the rest of the (no presential) 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 157 hours distributed as follows:

- 47 hours, approximately, of classroom activities (lectures, problems and laboratory face practices)

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- 42 hours of programming team work
- 62 hours of effective personal study
- 6 hours for exams

### 5.5. Bibliography and recommended resources