

30218 - Programming Theory

Syllabus Information

Academic Year: 2019/20

Subject: 30218 - Programming Theory

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel

Degree: 443 - Bachelor's Degree in Informatics Engineering
439 - Bachelor's Degree in Informatics Engineering

ECTS: 6.0

Year: 2

Semester: Second semester

Subject Type: Compulsory

Module: ---

1.General information

1.1.Aims of the course

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 learning methodology will develop itself at several levels:

- Lectures where the needed subject contents are presented and discussed, and where student participation is encouraged
- Development of practical sessions, where problems of greater complexity are solved
- Computer lab sessions, where the students develop the theoretical concepts with the writing of longer computer programs to solve more complex problems

These steps try to encourage continuous on-going work for students.

4.2.Learning tasks

The learning process for this subject is based on the following activities:

- Continuous students-work since the first session
- Learning of concepts and methods for analysis and design of correct and efficient programs by means of theoretical

sessions

- Use of this knowledge to the resolution of algorithmic problems
- Lab sessions where technologies needed to apply these concepts to real-world problems are presented, for some programming languages.
- Course assignments, which are carried out in small groups, in order to encourage in-group work.

4.3.Syllabus

The program for this subject is split into two main blocks, with one very short third block at the end. First one develops more advanced Object Oriented Programming concepts, the second focuses on Functional Programming, and the short third makes a sort presentation of other Programming Paradigms.

- Object-Oriented Programming
 - Classes
 - Inheritance and Polymorphism
 - Generic Programming
 - Containers and Data Structures
 - Type Inference - Exceptions
 - Object-Oriented Design - Design Patterns
 - Event-Driven Programming for GUI Design
 - Database and distributed resources networked access
- Functional Programming
 - Introduction to Functional Programming
 - Programming Languages for FP
 - Data and Types
 - Functions and expressions
 - Recursion
 - Lists and Higher-Order functions
- Other Programming Paradigms
 - Logic Programming
 - Dynamic Languages

4.4.Course planning and calendar

The course calendar is defined by the Escuela de Ingeniería y Arquitectura calendar.

The scheduling for this subject depends on the different Campuses.

In the EINA in Campus Rio Ebro, the scheduling runs this way:

- Theoretical classes: 2 hours/week
- Problem classes: 1 hour/week
- Lab sessions: 7 sessions with 2h duration, one each other week.

In the EUP in Campus Teruel, the scheduling is the following:

- Theoretical classes: 2 hours/week
- Problem classes and lab sessions: 2 hours/week.

Students work

To achieve the learning objectives in this subject, students work is estimated around 156 hours:

- 60h of scheduled classes (lectures, assignments, lab sessions)
- 30h of programming work in groups
- 60h of personal autonomous learning time
- 6h for final tests

4.5.Bibliography and recommended resources