COURSE DATA

Data Subject	
Code	34878
Name	Informatics II
Cycle	Grade
ECTS Credits	6.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
1403 - Degree in Telematics Engineering	School of Engineering	2	First term

Subject-matter

Degree	Subject-matter	Character
1403 - Degree in Telematics Engineering	4 - Information technology	Basic Training

Coordination

Name	Department
PEREZ MARTINEZ, MARIANO	240 - Computer Science

SUMMARY

The course “Ampliación de Informática” is a core course of the second year of the Telematics Engineering Degree. The course workload is 6 ECTS and it is given in the first four-month period of the second year.

This course is a continuation of the subject "Informática", which will delve into the basic concepts introduced in it. This course will introduce the concept of object and use this type of programming.

Students will learn the concept of class and object and use it in programming.
Also be introduced to students in the rudiments of algorithms, so learn how to evaluate basic algorithms and algorithms work on basic data structures, sorting, searching, etc.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

Have completed and passed the subjects Matemáticas I and II and Informática

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

1403 - Degree in Telematics Engineering

- G3 - Acquisition of the knowledge of the basic and technological subjects that allows students to learn new methods and theories and endows them with the versatility to adapt to new situations.
- G4 - Ability to solve problems with initiative, decision-making and creativity, and to communicate and transmit knowledge, abilities and skills, understanding the ethical and professional responsibility of the activity of a telecommunications technical engineer.
- B2 - Basic knowledge of the use and programming of computers, operating systems, databases and computer software with applications to computer engineering.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

Learning goals of the course:

Building a program correctly and efficiently from a formal and informal statement (G-3 y B-2).

To analyze the computational cost of a program (G-4 y B-2)

To Know object oriented pattern (G-3 y B-2).

To understand advantages and limitations of different alternative data structures and be able to select the best option in a particular case (G-3 y B-2).

Assess pros and cons of static and dynamic implementations of specific data structures (G-3 y B-2).

It is also pretended in this course to further develop the following skills:

Logical reasoning.

Analysis and synthesis.

Oral and written communication skills.

Personal work capacity.

Teamwork and group leadership skills.

DESCRIPTION OF CONTENTS

1. Algorithms and complexity

Design and analysis of algorithms.
Searching and sorting algorithms on vectors.

2. No OO Advanced C++ elements

Inline Functions. Functions Overloading. Default values in parameters.
Pointer data type. Allocation and freeing memory. Operations with pointers. Dynamic arrays.

3. Object-Oriented Programming

Introduction to OOP. Classes.
Constructors and Destructors. Other elements.

4. Reusing code in OOP

Object Composition.
Inheritance and Polymorphism.
Templates. Standard Templates Library (STL)

5. Linear data structures

Stacks, queues and lists

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Laboratory practices	20,00	100
Classroom practices	10,00	100
Development of group work	5,00	0
Development of individual work	5,00	0
Study and independent work	10,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	20,00	0
Preparing lectures	15,00	0
Preparation of practical classes and problem	20,00	0
Resolution of case studies	10,00	0
TOTAL	**150,00**	

TEACHING METHODOLOGY

Theoretical activities.

Description: The lectures will present the course contents providing a global vision, a detailed analysis of the key concepts and encouraging the student participation (G-3 y B-2). The workload of this section for the students is 20% of the total of the course.

Practical activities.

Description: The practical activities complement the theoretical classes and allow the students to put into practice the contents and improve the understanding of the course concepts (G-4 y B-2). They include the following types of classroom activities:

• Solving problems in class.
• Regular discussion of exercises and problems that the students have previously tried to work out.

• Laboratory sessions.

• Support tutorial sessions (individualized or in group).

• Individual evaluation of questionnaires to be done in class with the help of professors.

The workload of this section for the students is 30% of the total of the course.

Personal work.

Description: It is the work that the student must carry out individually out of the classroom timetable. It tries to promote the autonomous work habit. Activities in this group are: monographs, guided literature search, exercises and problems as well as preparation of classes and exams (G-4). The workload of this section for the students is 50% of the total of the course.

During the course the e-learning (pizarra virtual) platform of the University of Valencia will be used to support the teaching activities. This platform allows the access to the course materials used in the classes as well as additional documents, solved problems and exercises.

EVALUATION

The evaluation of the course assessment is the following:

(C) Continuous assessment. It is based on participation and the degree of involvement in the teaching-learning process. In this section it will be taken into account the attendance to classroom activities and the resolution of exercises and problems. This part is not recoverable in the second call.

(E) Individual examination. Consisting of several exams, they will include both theoretical and practical questions and problems. There will be some midterm exams distributed during the period of classes and a final exam out of this period that is fixed in the official exam calendar. This part of the assessment will represent the 60% of the final mark and the weight of each individual exam is as follows:

E= 50%(average of midterm exams) + 50%*(final exam)

(P) Laboratory activities assessment. The marks of this part will take into account the achievement of objectives in the laboratory sessions. These activities will be carried out individually and/or in-group. This part is not recoverable in the second call.

The final mark of the course will be calculated as follows:

M= 0.1*C+0.6*E+0.3*P

A minimum mark of 4,5 out of 10 for each part (continuous assessment, midterm exams, final exam and **Laboratory activities assessment**) is required to obtain a final average mark (M), which must be equal or higher than 5 out of 10 to pass the course. The student will fail the course if some mark is below 4,5 or the average is lower than 5.

The second exams session for this course will not consider midterm exams and the final mark will be calculated as follows:

M= 0.1*C + 0.7*FinalExam + 0.2*P

In any case, the evaluation system will be agreed with the Regulation of Evaluation and Qualification of the University of Valencia for Degrees and Masters

REFERENCES

Basic

- Apuntes de la asignatura.
- Como programar en C++, Harvey M. Deitel & Paul J. Deitel, Pearson Educación, 2003

Additional

- - Data structures and algorithms in C++. Michael T Goodrich, Roberto Tamassia, David M. Mount New York, John Wiley & Sons, 2004
- TADs, estructuras de datos y resolución de problemas con C++ /Larry R. Nyhoff Madrid. Prentice-Hall 2006
- Fundamentals of data structures in C++. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed New York. Silicon Press, 2007