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COURSE DATA

Data Subject

Code	34878
Name	Informatics II
Cycle	Grade
ECTS Credits	6.0
Academic year	2023 - 2024

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

OUTCOMES

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

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.

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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 subject will be carried out through:

(C) Continuous assessment, based on participation and degree of involvement in the teaching-learning process, taking into account regular attendance to scheduled face-to-face activities and the resolution of proposed questions and problems. This component will not be recoverable in the second examination period.

(I) Individual objective test, consisting of several assessments throughout the semester, including both theoretical-practical questions and problems. There will be several partial assessments during the course and a final exam on the official examination schedule. The weight of this component in the overall grade of the subject will be 75%, and the relative weight of the partial assessments compared to the final exam will be:

I = 50% Assessments + 50% Final Exam

(P) Evaluation of the practical activities based on the evaluation of the achievement of the objectives set in the laboratory sessions. In the evaluation, not only the delivered code will be taken into account, but, above all, the result obtained in several oral/written tests related to the practical activities. This part will not be recoverable in the second examination period.

Final Grade = 0.05C + 0.75I + 0.2*P

It is necessary to obtain at least a 4.5 out of 10 in the partial assessments, exam, and practical activities in order to calculate the average grade.

In the second examination period, the grades from the assessments and the continuous assessment component will not be considered, and the weights of each component will be modified as follows:

Final Grade = 0.85Final Exam + 0.15P

In any case, the evaluation system will be governed by the regulations established in the Evaluation and Grading Regulations of the University of Valencia for Bachelor's and Master's degrees.

REFERENCES

Basic

- Apuntes de la asignatura.

- H. M. Deitel y P. J. Deitel. Cómo programar en C++ (Novena Edición). Prentice-Hall, 2014. Disponible online en bibliotecasuv.

- Sharma, A. K. Object-oriented programming with C++. Dorling Kindersley India, [2014]. Disponible online en bibliotecasuv.

Additional

- Weiss, Mark A. Data Structures and Algorithm Analysis in C++, International Edition. Pearson Education Limited, 2014. Disponible online en bibliotecasuv.

- Goodrich, Michael T ; Tamassia, Roberto ; Mount, David M. Data structures and algorithms in C++. Wiley, 2011. Disponible online en bibliotecasuv.

- Mohanty, Sachi Nandan ; Tripathy, Pabitra Kuma. Data Structure and Algorithms Using C++: A Practical Implementation. John Wiley&Sons, Incorporated, 2021. Disponible online en bibliotecasuv.

- Dale, Nell ; Weems, Chip ; Richards, Tim . C++ Plus Data Structures. Burlington: Jones & Bartlett Learning, LLC, 2016. Disponible online en bibliotecasuv.