



## COURSE DATA

### DATA SUBJECT

**Code:** 34878  
**Name:** Informatics II  
**Cycle:** Undergraduate Studies  
**ECTS Credits:** 6  
**Academic year:** 2025-26

### STUDY (S)

Degree	Center	Acad. year	Period
1403 - Degree in Telematics Engineering	Escola Tècnica Superior d'Enginyeria	2	First quarter
1935 - Double Degree Program in Mathematics-Telematics Engineering	Facultat de Ciències Matemàtiques	3	First quarter

### SUBJECT-MATTER

Degree	Subject-matter	Character
1403 - Degree in Telematics Engineering	Information technology	BASIC
1935 - Double Degree Program in Mathematics-Telematics Engineering	Tercer curso	COMPULSORY

### COORDINATION

PEREZ MARTINEZ MARIANO

## 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.

c.

## 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 Matemàtiques I and II and Informàtica

## COMPETENCES / LEARNING OUTCOMES

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B2 - Basic knowledge of the use and programming of computers, operating systems, databases and computer software with applications to computer 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.

## 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

#### PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Laboratory	20,00
Classroom practices	10,00
<b>Total hours</b>	<b>60,00</b>

#### NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	10,00
Independent study and work	15,00
Preparation of lessons	35,00
Preparation for assessment activities	20,00
Resolution of case studies	10,00
<b>Total hours</b>	<b>90,00</b>

### 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, with an oral part and a written part, 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:

$I = 50\% \text{ Assessments} + 50\% \text{ Final Exam}$

(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.

$\text{Final Grade} = 0.05C + 0.75I + 0.2*P$



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:

$$\text{Final Grade} = 0.85\text{Final Exam} + 0.15P$$

Copying or plagiarism of any activity that is part of the evaluation will result in the impossibility of passing the course, and the student will then be subject to the appropriate disciplinary procedures indicated in the ACTION PROTOCOL FOR FRAUDULENT PRACTICES AT THE UNIVERSITY OF VALENCIA ([ACGUV 123/2020](#)).

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

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