COURSE DATA

Data Subject

Code	34877
Name	Informatics I
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	1	First term

Subject-matter

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

Coordination

Name	Department
ROMERO GOMEZ, VERONICA	240 - Computer Science

SUMMARY

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

This course comprises basic computer concepts such as: basic components, potential uses and limitations.

The aim of the course is to get a deeper knowledge in the design of algorithms using structured programming, as well as fundamental data structures.

In the laboratory sessions, the student will apply the theoretical concepts, will use some basic software tools and will program some simple software using a general purpose structured programming language.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

No prerequisites are established.

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

1 Ability to describe the parts making up a computer and explaining their functioning. (G-3,B-2)

2 Ability to list various peripheral devices and explain their functioning. (G-3,B-2)

3 Ability to perform basic file operations. (G-3,B-2)

4 Ability to perform basic management tasks in an operating system. (G-3,B-2)

5 Ability to edit technical documents, use spreadsheets, create presentations and small databases using office application programs. (G-3,B-2)

6 Ability to use network application programs to visit websites, search for contents online, publish web content, etc. (G-3,B-2)

7 Ability to describe algorithmic solutions to problems. (G-3,G4,B-2)

8 Ability to use a programming language to describe the algorithm that solves a given problem. (G-3,G4,B-2)

9 Ability to describe basic types, numeric and non-numeric data. (G-3,B-2)

10 To design simple computer programs with one or more loops. (G-3,G4,B-2)

11 To design computer programs structured by simple functions. (G-3,G4,B-2)

12 To design simple computer programs using conditional structures. (G-3,G4,B-2)

13 To document properly the program codes. (G-3,G4,B-2)

14 Understanding the meaning of algorithm and program. (G-3,G4,B-2)

15 Understanding the concept and the major programming languages. (G-3,B-2)

16 Understanding advantages and limitations of different data structures and being able to choose the best alternative in a particular case. (G-3,G4,B-2)

17 Knowing the most common design patterns in object oriented programming. (G-3,B-2)

As a complement to the above mentioned items, the student will acquire the following social and technical skills:

• Logical reasoning. (CB-4,CB-5,G-4).

• Analysis and synthesis of problems. (CB-4,CB-5,G-4).

• Oral and written communication skills. (CB-4,CB-5,G-4).

• Personal work capacity. (CB-4,CB-5,G-4).

• Teamwork and group leadership skills. (CB-4,CB-5,G-4).

DESCRIPTION OF CONTENTS

1. Introduction

The computer concept: Basic concepts.
Computer Internal structure.
Software: Operating system. Utilities.
Information management.

2. Programming in high level languages.

Algorithm concept.
Languages and programming paradigms.
Characteristics of high-level programming languages: Variables and constants. Simple Data Types.
Program development phases: Analysis of the problem.
Algorithm design.
Programming.

3. Structured programming.

Structured programming Theorem.
Design of structured programs.
Flow control structures: Sequential structure. Conditional structure. Iterative structure.

4. Modular programming.

Module definition
Modular programming.
Subprogram definition: Functions.
Subprogram parameters.
Identifiers scope.
Recusivity.

5. Structured Data Types

Vectors, matrices, strings and records

6. Files

The file concept.
Access types.
Logical and physical files.
Binary and text files.
Processing files.
Relational databases.

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. (G-3, G-4, B-2)

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

Practical activities. (G-3, G-4, B-2)

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. They include the following types of classroom activities:

- Solving problems in class.

- Regular discussion of exercises and problems that they 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 20% of the total of the course.

Personal work. (G-3, G-4, B-2)

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. The workload of this section for the students is 45% of the total of the course.

Teamwork in small groups. (G-3, G-4, B-2)

Description: It will be carried out by small groups of students (2-4). It consists of work to be done out of the class timetable in form of exercises and problems. This work tries to improve the teamwork and leadership skills. The workload of this section for the student is 15% of the total charge of the course.

During the course the e-learning (Aula 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 course assessment is as follows:

(C) **Continuous assessment.** (G-3, G-4, B-2), it is based on the participation and the degree of involvement of the students in the teaching-learning process.The attendance on regular basis to on-campus lectures/activities, the resolution of exercises and problems proposed (individually or in groups) and oral presentations will be taken into account. This activities cannot be retaken.

(E) **Individual examination.** (G-3, G-4, B-2), this part consists in several individual midterm tests (these tests are not compulsory and they cannot be retaken) and a final exam (compulsory) which is dated in advance in the official calendar. The final mark is computed as: E = 50%(average of midterm tests) + 50%*(final exam). In case the midterm tests are not done, the final mark is the one of the final exam.

(P) **Laboratory activities assessment.** (G-3, G-4, B-2), this part includes laboratory sessions (they are compulsory and they cannot be retaken). This part also include a final project. The mark of this part is computed as: P = 70% Sessions + 30% Final Project

The final qualification for the first call is calculated as follows: Final Mark=0.1*C+ 0.6*E+0.3*P. For the second call, it is calculated as: Final Mark = 0,1*C + 0,7*E+ 0,2* P.

You need to get at least a mark of 4.5 (out of 10) in each of the parts. In such a case, a mean value will be calculated as the final mark, otherwise the course is failed.

During the tests it is forbidden the use of calculators, watches, mobiles phones, laptops, tablets, electronic devices or documents.

The assessment procedure follows the guidelines of the Reglament de Avaluació i Qualificació de la Universitat de València (https://webges.uv.es/uvTaeWeb/MuestraInformacionEdictoPublicoFrontAction.do?accion=inicio&idEdictoSeleccionado=5639)

REFERENCES

Basic

- Apuntes de la asignatura.
- [G. Beekman (2005)]. Introducción a la informática (Prentice-Hall).
- [H.M. Deitel, P.J. Deitel (2009)]. C++ como programar (Prentice-Hall).

Additional

- [W. Savitch (2007)]. Resolución de problemas con C++. El objetivo de la programación (Prentice-Hall).

- [L. Joyanes (2006)]. Programación en C++: Algoritmos, estructuras de datos y objetos (MacGraw Hill).
- [L. Joyanes, I. Zahonero (2001)]. Programación en C: Metodología, algoritmos y estructuras de datos (MacGraw Hill).