# COURSE DATA

| Data Subject | |
|---|---|
| **Code** | 34805 |
| **Name** | Informatics I |
| **Cycle** | Grade |
| **ECTS Credits** | 6.0 |
| **Academic year** | 2021 - 2022 |

**Study (s)**

| Degree | Center | Acad. year | Period |
|---|---|---|---|
| 1402 - Degree in Telecommunications Electronic Engineering | School of Engineering | 1 | First term |

**Subject-matter**

| Degree | Subject-matter | Character |
|---|---|---|
| 1402 - Degree in Telecommunications Electronic Engineering | 4 - Information technology | Basic Training |

**Coordination**

| Name | Department |
|---|---|
| MARTINEZ PLUME, JAVIER | 240 - Computer Science |

# SUMMARY

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

This course tries to teach some basic computer concepts like, its basic components, potential uses and limitations.

Students will understand and management some basic concepts related to operating systems as well as the description and use the network as a key part in communicating information between computers.

They also will learn a basic knowledge of different tools, as well as a brief introduction to the concept of database.

One main objective of the course is to get a deeper knowledge of the design of algorithms using

## 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

### 1402 - Degree in Telecommunications Electronic 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:

- Basic knowledge about the internal structure of a computer, in both, the physical (CPU, memory,...) and the logical scope (operating system, programs,...).
- Knowledge and use of the basic computer tools at the operating system level.
- Use the basic tools for managing files on a network.
- Understand the database operations and perform simple tasks on them.
- Analyze problems, design and develop algorithms to solve problems using a computer.
- Know the basic data types, variables, constants, control structures and data structures of the procedural programming languages to develop programs.
- Use the procedural programming paradigm to solve problems using a computer.
- Learn how to code simple algorithms using a structured programming language.

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. introduction

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

### 2. Computer networks.

Introduction and Basics.
Utilities to share information.

### 3. 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.

### 4. Structured programming.

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

### 5. Modular programming.

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

### 6. Structured Data Types

Vectors, matrices, strings and records

### 7. Files and DataBase

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

## 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. 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. 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 20% 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. The workload of this section for the students is 45% of the total of the course.

**Teamwork in small groups.**

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 (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 breakdown 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. The weight of this part will be 20% of the final mark.

**(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 50% of the final mark and the weight of each individual exam is as follows:

**E= 60%(average of midterm exams) + 40%*(final exam)**

The weight of all of the midterm exams will be the same.

**(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 and its weight is 30% of the final mark.

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

**M= 0.2*C+0.5*E+0.3*P**

A minimum mark of 3,5 out of 10 for each part 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 3,5 or the average is lower than 5.

*Alternate assessment: aimed at students study part-time or who can not attend class*

**Nota Final = 0,1*C + 0,7*I + 0,2* P**

The second exams session for this course will be based on a single final exam.

In any case, the evaluation system will be governed by what is established in the Evaluation and Qualification Regulations of the University of Valencia for Degrees and Masters.

(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).
- [W. Savitch (2007)]. Resolución de problemas con C++. El objetivo de la programación (Prentice-Hall).
- [H. Korth, A. Silberschatz (2006)] Fundamentos de bases de datos (MacGraw Hill)

### Additional

- [H.M. Deitel, P.J. Deitel (2009)]. C++ como programar (Prentice-Hall).
- Referencia c2: [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).

- Recursos por internet
  http://arco.esi.uclm.es/~david.villa/pensar_en_C++/

## ADDENDUM COVID-19

**This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council**

**Contents**

The contents initially collected in the teaching guide are maintained.

**Volume of work and temporary planning of teaching**

The different activities described in the Teaching Guide are maintained with the planned dedication.

The material for the monitoring of classroom theory / practical classes allows to continue with the temporary teaching planning both in days and in hours, both if the teaching is in the classroom or not.

**Teaching methodology**

In the classroom theory and practical classes, there will be the maximum possible attendance, always respecting the sanitary restrictions that limit the capacity of the classrooms to 50% of their usual occupation. Depending on the capacity of the classroom and the number of students enrolled, it may be necessary to distribute the students into two groups. If this situation arises, each group will attend classroom theory and practical sessions with physical presence in the classroom by rotating shifts, thus ensuring compliance with the criteria for occupying spaces. The rotation system will be established once the actual enrollment data is known, guaranteeing, in any case, that the attendance percentage of all the students enrolled in the subject is the same. For classroom sessions and theory sessions that are not face-to-face, there will be a preferably synchronous online teaching model, as long as compatibility with other scheduled activities allows. Online teaching will be carried out by synchronous videoconference respecting the schedule, or, if not possible, asynchronous.

With respect to laboratory practices, attendance at sessions scheduled in the schedule will be totally face-to-face.

Once the actual enrollment data is available and the availability of spaces is known, the Academic Committee of the Degree will approve the Teaching Model of the Degree and its adaptation to each subject, establishing in said model the specific conditions in which it will be developed teaching the subject.

If there is a closure of the facilities for sanitary reasons that totally or partially affects the classes of the subject, these will be replaced by non-contact sessions following the established schedules.

**Evaluation**

The evaluation system described in the Teaching Guide of the subject in which the different evaluable activities have been specified as well as their contribution to the final grade of the subject is maintained.

If there is a closure of the facilities for health reasons that affect the development of any face-to-face evaluable activity of the subject, it will be replaced by a test of a similar nature that will be carried out in virtual mode using the computer tools licensed by the University of Valencia. The contribution of each evaluable activity to the final grade for the course will remain unchanged, as established in this guide.

**Bibliography**

The bibliography recommended in the Teaching Guide is kept as it is accessible.