COURSE DATA

Data Subject	
Code	34806
Name	Informatics II
Cycle	Grade
ECTS Credits	6.0
Academic year	2018 - 2019

Study (s)

Degree	Center	Acad. year	Period
1402 - Degree in Telecommunications Electronic Engineering	School of Engineering	2	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

Following the course 34805 (Informatics), is to delve into the basic concepts introduced in it. This will introduce the concept of object and use this type of programming. Students use 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. 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

Have taken and passed the courses Matemáticas I y II, Informática

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

The student should be able to:

• Build a program correctly and efficiently from a statement formally and informally.

• Analyze the computational cost of a program

• Use the tools and patterns characteristic of the methodology of objects such guidance for troubleshooting.

• Decide on and create the most appropriate data structure and implementation more efficient for each particular problem.

• Assess pros and cons of static and dynamic implementations of structures of concrete data.

In addition to the specific objectives mentioned above, the course will encourage the development of several generic skills, among which include:

• Modelling and problem solving: knowing how to solve problems, being able to identify the essential elements of a situation and make the approximations required to reduce the problem to a manageable level.

• Problem solving and computer skills.

• Skills in oral and written communication.

• Teamwork: Learn to cooperate, interact, and divide the work with others to solve problems

DESCRIPTION OF CONTENTS

1. Algorithms and complexity

Design and analysis of algorithms

2. Arrays algorithms

Search algorithms
Sorting algorithms

3. Dynamic memory allocation

Pointer
Dynamic memory allocation

4. Concept of class and object. Object-Oriented Programming

Structure of a class
The concept of object
examples
Inheritance

5. Data structures. Abstract data types

Lists, Stacks and Queues

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.

REFERENCES

Basic

- Apuntes de la asignatura.
  - Como programar en C++, Harvey M. Deitel & Paul J. Deitel, Pearson Educación, 2003. (CI 681.3.06 DEI)
  - [W. Savitch (2007)]. Resolución de problemas con C++. El objetivo de la programación (Prentice-Hall).
  - TADs, estructuras de datos y resolución de problemas con C++ /Larry R. Nyhoff Madrid. Prentice-Hall 2006. (CI 681.3 NYH)

Additional

- Data structures and algorithms in C++. Michael T Goodrich, Roberto Tamassia, David M. Mount New York, John Wiley & Sons, 2004 ISBN 0471429244.
  - Fundamentals of data structures in C++. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed New York. Silicon Press, 2007 (CI 681.3.06 HOR)