Programming

Academic Year: (2023 / 2024) **Review date: 15-05-2023**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: VELASCO DE DIEGO, MANUEL

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 1

Branch of knowledge: Engineering and Architecture

OBJECTIVES

When passing this subject, students will be able to:
1. Have basic knowledge and comprehension about computer systems and programming applied to Engineering
2. Be aware of the multidisciplinary context of Industrial Engineering
3. Identify, formulate and solve engineering problems using computing methods
4. Combine theory and practice to solve engineering problems using computing methods, programming methods

DESCRIPTION OF CONTENTS: PROGRAMME

1 Basic Concepts
- 1.1 Algorithm
- 1.2 Program
- 1.3 Pseudocode
- 1.4 Structured Programming

2 C language programming
- 2.1 C syntax
  - a Parts of program
  - b Include, define
  - c Constants
  - d main() function
- 2.2 Datatypes
- 2.3 Flow Control
- 2.4 Libraries
- 2.5 Functions
  - a Declaration
  - b Definition
  - c Parameters
  - d Reference and value parameters
- 2.6 Input/Output
- 2.7 Arrays
  - a Vectors
  - b Matrix
  - c Strings
  - d Parameters in functions
- 2.8 Structs
  - a Definition
  - b Referenced in functions
- 2.9 Memory management
  - a Pointers
  - b Static Memory
  - c Dynamic Memory
- 2.10 Object Oriented Programming: concepts
- 2.11 Classes and Objects in C++
- 2.12 Inheritance, polymorphism, encapsulation

LEARNING ACTIVITIES AND METHODOLOGY

- Master lectures, reduced groups classes for resolution of doubts, students' presentations, individual tutorships and student's personal work; guided to the acquisition of theoretical knowledge (3 credits ECTS).
- Reduced groups for both laboratory practices and classes of problems, individual tutorships and student's personal work; guided to the acquisition of practical abilities related to the program of the subject (3 credits ECTS).

ASSESSMENT SYSTEM

Continuous evaluation based on homework, participation during the classes and tests for the evaluation of abilities and knowledge.
Theory accounts for the 50% of the grade.
Practices account for the other 50%
It is necessary to pass both theory and practices

The continuous evaluation consists of 2 exams:

a) algorithmics: 20% of the total theory grade. No minimum grade required.
b) functions, arrays and structs: 40% of the total theory grade. Minimum grade of 2.5 out of 10 required.

The theory exam of the ordinary call is the remaining 40%. Minimum grade of 2.5 out of 10 required.

Students can take the ordinary exam without taking the continuous assessment. In this case, this exam has a weight of 70% in the theoretical part of the subject.

% end-of-term-examination:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

BASIC BIBLIOGRAPHY

- Bjarne Stroustrup The C++ Programming Language, Prentice Hall, 2013
- Brian Kernighan C Programming Language, Prentice Hall.