POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	**SUBJECT DESCRIPTION**	**MODELO** PED.013.03

Course	**E**nergy and environment					
Subject	Programming					
Academic year	2023/2024	*Curricular year*	1st	*Study period*	1st semester	
Type of subject	Compulsory	*Student workload (H)*	Total: 84	Contact: 45	*ECTS*	3
Professor(s)	Filipe Caetano					
☐ *Area/Group Coordinator* ☒ *Head of Department* *(select)*	José Carlos Fonseca					

PLANNED SUBJECT DESCRIPTION

Clique**1. LEARNING OBJECTIVES**

1. Know the fundamental concepts for computer programming
2. Develop the ability to analyze problems, dividing them into simpler problems and describing, in a clear and objective way, the Steps necessary for their resolution.
3. Write programs with graphical interfaces, using C # and IDE Visual Studio, for coding algorithms.

2. PROGRAMME

1. Introduction to computers
    A. Computer architecture basics
    B. Numbering bases.
    C. Information representation
2. Programming languages
    A. Introduction
    B. Phases of program development.
    C. Programming languages
3. Algorithmic language
    A. Algorithm concept
    B. Stages of development of an algorithm
    C. Importance, syntax.

D. Flowchart and pseudocode.

E. Simple variable types, structured variable types

F. Input and output instructions

G. Control structures

4. Programming in the high-level C # language

A. introduction.

1. Objects, properties, methods and events

2. Visual Studio development environment

B. Definition of variables.

C. Use of Conditions, Cycles and Functions.

D. Passing parameters.

E. Data input and output

F. Control structures

G. Arithmetic operators and intrinsic functions

H. Logical and relational operators

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

Contents 1 to 2 are consistent with objective 1, as the basic concepts of computer architecture, numbering bases, information representation, programming languages and phases of computer program development are exposed.

Content 3 is coherent with objective 2, because the concept of algorithm is defined, the necessary phases to develop algorithms are presented, the elements of the algorithmic language are described and two ways of writing algorithms are presented, using pseudocode and flowcharts.

Content 4 is consistent with objective 3 because the elements of the C # language are presented, as well as the objects of the graphical interface allowing the implementation of the algorithms developed in the content 3.

4. MAIN BIBLIOGRAPHY:

0. Caetano, F. (2020). Apontamentos da disciplina. Departamento de Informática. Moodle – ESTG/IPG.
1. Loureiro, Henrique; C# 5.0 com Visual Studio 2012, FCA , 2013, - ISBN 978-972-722-752-5.
2. Delgado, José; Arquitetura de Computadores, FCA, 2014, ISBN: 9789727227891
3. Rocha, A. Adrego, Estruturas de Dados e Algoritmos Em C, FCA, 2014, ISBN: 9789727227693

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

1. Expository lesson;
2. Interactive lesson;
3. Problem solving;

Evaluation Rules:

- Continuous evaluation or Exam regular season

Practical assignments - 70%

Theoretical-Practical Test - 30%

- Exam supplementary or special season

Theoretical-Practical Test (100%)

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

Expository lesson is in accordance with objectives 1 and 2 because it is necessary to present the theoretical knowledge of the course to students.

Interactive lesson is consistent with objectives 1 and 2 because the interaction of students with the teacher facilitates the learning of concepts. Algorithms are presented focusing on each aspect of its writing phases and the data structures used. Students can question the teacher about any element of the algorithm, exchange and enrich ideas allowing to increase the knowledge that each one has.

Problem solving is consistent with objective 3 because it allows the student to apply theoretical knowledge in writing algorithms with all their phases.

Individual assignments are consistent with the objectives because the accomplishment of individual assignments, which consist of the development of algorithms, documentation of all its development phases, preparation of a presentation and defense allow the student to solidify their knowledge acquired in the course and develop the their individual ability to solve problems in general by writing algorithms.

7. CONTACTS AND OFFICE HOURS

Office 32, caetano@ipg.pt

Monday 14h00 – 17h30

Tuesday 09h00 – 12h00

Date: 31 de october de 2023