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| POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA | SUBJECT DESCRIPTION | MODELO PED.013.03 |
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| Course | Data Science and Artificial Intelligence | | | | | |
| Subject | Introduction to Programming | | | | | |
| Academic year | 2022/2023 | Curricular year | 1st | Study period | 1st semester | |
| Type of subject | Compulsory | Student workload (H) | Total: 168 | Contact: 90 | ECTS | 6 |
| Professor(s) | José Alberto Quitério Figueiredo | | | | | |
| <input checked="" type="checkbox"/> Area/Group Coordinator <input type="checkbox"/> Head of Department | (select) | José Carlos Martins da Fonseca | | | | |

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

Upon completion of the UC, students should be able to:

1. Write and develop programs in C.
2. Differentiate and apply the elements of language C.

2. Program algorithms in C. PROGRAMME

1. *Introduction to Programming in C*
 - 1.1. *Program structure*
 - 1.2. *Simple data types, variables, operators and expressions*
 - 1.3. *Input and output data*
 - 1.4. *Control structures*
 - 1.5. *Introduction to Integrated Development Environment (IDE).*
2. *Functions*
 - 2.1. *Operation and structure*
 - 2.2. *Passing arguments*
 - 2.3. *Recursion*
3. *Compound Data Types*
 - 3.1. *Strings*
 - 3.2. *Arrays and Multi-dimensional Arrays*
 - 3.3. *Structures, union e enumerated*
4. *Pointers*
 - 4.1. *Introduction to pointers and Pointer type*
 - 4.2. *Dynamic memory manipulation*
5. *Files*
 - 5.1. *File Handling*
 - 5.2. *File access*

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

Contents 1 to 5 are consistent with Objective 1 - "Write and develop programs in C" because they present the fundamentals of programming language C to write programs in C.

Contents 1 to 5 are consistent with Objective 2 – "Differentiate and apply the elements of language C" because are taught and exemplified the concepts, programming techniques and implementation of the different elements of programming in C to solve problems are taught and exemplified.

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The contents 1 to 5 are consistent with Objective 3 – “Programming algorithms in C” because, for scheduling algorithms, it is necessary to differentiate and implement elements of C and interpret algorithms in algorithmic language. One of the goals of the course of algorithms and data structures is to “write algorithms using pseudocode and flowchart symbology,” which allows the student to interpret algorithms. We seek interdisciplinarity as a way to motivate, develop and consolidate the objectives of the two courses.

4. MAIN BIBLIOGRAPHY

Mandatory:

- [1] Manual provided by the teacher.
- [2] António Rocha (2006), Programação Avançada Usando C, FCA, ISBN 972-722-546-2
- [3] Pedro Guerreiro (2006), Elementos de programação em C. 3ª edição atualizada e aumentada. FCA, ISBN 972-722-510-1
- [4] Luis Damas (1999), Linguagem C, FCA. ISBN 972-722-156-4

Recommended:

- [5] Knuth, Donald E. (1998). “The Art of Computer Programming – VOLUME 1,2,3,4”. ADDISON – WESLEY. Versão para download free: <http://techtweets.com.bd/en/downloads/73>, em 23 de Setembro de 2014.

- [6] Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language, Published by Prentice-Hall. Versão para download free: <http://books.cat-v.org/computer-science/c-programming-language/The.C.Programming.Language.2nd.Edition.pdf>, em 23 de Setembro de 2014.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Teaching methodologies: Lecture, Interactive lesson, Problem solving, Project

Evaluation methodologies:

Continuous evaluation. Students must attend at least 2/3 of the class hours to qualify for ongoing assessment in this subject. Students with student worker status do not have to meet this requirement.

- 1. Practical test: 50%
- 2. Written test: 50%

Final exam evaluation

- 1. Written test. (100%)

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

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Lectures are consistent with the objectives because of the need to present the theoretical knowledge of the course to students. It is necessary to introduce, verbalize and illustrate each of the elements and techniques of programming language C.

Interactive Lessons are consistent with the objectives for student/ teacher interaction to help learning the concepts in addition to the introduction of new ideas, perspectives and solutions that can be applied in the implementation, in the manipulation and study of different strategies for code development.

Problem solving is consistent with the objectives for the application of theoretical concepts to practical exercises inspired realistically and related to study helps consolidate the material, enhancing know-how. The problems are gradually presented in level of difficulty and complexity as the different contents will be presented and consolidated.

Group work is consistent with the goals since the work allows students to develop their individual capacities to organize and recognize the advantages of working in groups. On completion of their work, the students have to solve a problem with one dimension being required to apply most of the knowledge acquired. Group work also allows students to consolidate the knowledge acquired in the course and develop their ability to solve problems.

DATE

17 November 2023

SIGNATURES

Professor(s), Area/Group Coordinator or Head of Department signatures

Professor

(signature)

Area/Group Coordinator

(signature)