SUBJECT DESCRIPTION

Course	Mechanics and Industrial Informatics					
Subject	**Programming I**					
Academic year	2023-24	Curricular year	1 year	Study period	1º sem	
Type of subject	Mandatory	Student workload (H)	Total: 162	Contact: 60	ECTS	6
Professor(s)	Paulo Vieira					
☐ Area/Group Coordinator ☐ Head of Department	(select)	José Fonseca				

GFUC PLANNED

1. LEARNING OBJECTIVES

1. Design and development of programs in C.

2. Differentiate and apply the elements of the C language.

3. Program algorithms in C

2. PROGRAMME

1. Introduction to programming in C

1.1. Functioning and structure of a program

1.2. Simple Data Types, Variables, Operators, and Expressions

1.3. Data input and outputs

1.4. control structures

1.5. Introduction to the integrated development environment (IDE).

2. Functions

2.1. Functioning and structure

2.2. Parameter passing

2.3. recursion

3. Types of composite data

3.1. strings of characters

3.2. Vectors and matrices

3.3. Structures, Unions and Enumerations

4. Sharpeners

4.1. Concept and application

4.2. Dynamic memory manipulation

5. Files

5.1. Definition and use

5.2. file manipulation operations

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

Contents 1 to 5 are consistent with objective 1, as the fundamental elements of the programming language in C for the design and development of programs are exposed.

Contents 1 to 5 are consistent with objective 2, because the concepts, programming techniques and application of different programming elements in C language in problem solving are taught and exemplified. Contents 1 to 5 are consistent with objective 3, because to program algorithms it is necessary to differentiate and apply the elements of the C language and interpret algorithms in algorithmic language. One of the objectives of the curricular unit on algorithms and data structures is "to write algorithms using pseudocode and flowchart symbology". What allows the student to know how to interpret algorithms. We seek interdisciplinarity as a way to motivate, develop and consolidate the objectives of the two curricular units.

4. MAIN BIBLIOGRAPHY

Mandatory:

[1] teacher's notes.

[2] Modern C for Absolute Beginners: A Friendly Introduction to the C Programming Language 1st ed. Edition. Slobodan Dmitrović. Apress. 2021. ISBN: 978-1484266427

[3] Programação Avançada Usando C. António Manuel Adrego da Rocha. FCA. 2006. ISBN: 972-722-546-2

[4] Elementos de programação em C - Pedro Guerreiro. - 3ª edição atualizada e aumentada. FCA, 2006. ISBN: 972-722-510-1

[5] Linguagem C. Luis Damas. FCA. 1999. ISBN: 972-722-156-4 Recomendada:

[6] 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.

[7] 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/cprogramming-language/The.C.Programming.Language.2nd.Edition.pdf, em 23 de Setembro de 2014.

[8] Jeff Szuhay. Learn C Programming: A beginner's guide to learning the most powerful and general-purpose programming language with ease, 2nd Edition.packt . 2022. ISBN-10, 1801078459. ISBN-13, 978-1801078450. (https://github.com/PacktPublishing/Learn-C-Programming-Second-Edition)

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Teaching methodologies:

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

EVALUATION RULES

Evaluation in each season: Written test - 100%.

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

Expository lesson is consistent with the objectives due to the need to present theoretical content to students. It is necessary to introduce, verbalize and exemplify each of the elements and techniques of the programming language in C.

2. Demonstrative lesson is consistent with the objectives because it allows to consolidate the knowledge exposed giving it a practical meaning. This practical meaning allows the introduction of new ideas, perspectives and solutions that can be applied both in the analysis phase and in the implementation of solutions.

3. Problem solving, through worksheets, is consistent with the objectives as they allow the application of theoretical content to practical exercises, related to the material taught. This consolidates knowledge and enhances know-how.

7. ATTENDANCE

No consideration

8. CONTACTS AND OFFICE HOURS

Nome	Email	Telefone	Gabinete	Horário de atendimento
Paulo Vieira	pavieira@ipg.pt		36	

DATE

October 2023

SIGNATURES

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

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