



UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Programming

Academic Year 2026/2027

1. Organic Unit

Faculty of Business and Economic Sciences

2. Course

Computer Engineering

3. Cycle

1st

4. Course Unit

Programming (L9008)

5. Scientific Area

6. Curricular Year

1st

7. Type of Curricular Unit / Semester

2nd Semester



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8. Class type and workload (work time)

Theoretical classes:	
Practical classes:	
Theoretical-Practical Classes	30,00
Tutorial Guidance:	20,00

9. ECTS Credits

6,00

10. Scientific Area Coordinator

11. Regent

Prof. Doutor RAUL EDUARDO CAPELA TELLO RATO

12. Assistants

13. Teaching Language

Portuguese

14. General Objectives

Consolidate fundamental knowledge of C programming, explore advanced concepts such as pointers, structs, and binary file handling, culminating in practical application through the development of graphical interfaces in C#.

15. Specific Objectives

Improve understanding of pointers and structs in C.
Enable students to create and use C libraries efficiently.
Develop skills in implementing interactive graphical interfaces.

16. Skills to be acquired

Improve knowledge of advanced data manipulation concepts in C.
To train in the creation of modular and reusable libraries in C.
Develop skills in implementing interactive graphical interfaces.
Integrate good design practices and collaborate effectively on practical projects.

17. Teaching Methodology

Theoretical classes to teach the fundamental concepts, followed by practical activities, tutorial classes, exercises, and group projects, providing hands-on learning and stimulating the application of the acquired knowledge in solving real problems.



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18. Course Unit Program

1. Review of fundamentals
 - 1.1 Review of the fundamental concepts of programming and algorithms.
 - 1.2 Review of control structures and data manipulation.
2. Review and deepening of the concepts of Pointers and Structs
 - 2.1 Concept of pointers
 - Explanation of pointers as variables that store memory addresses.
 - 2.2 Struct manipulation
 - Using structs to organize and manipulate heterogeneous data.
 - Allocating memory to manipulate structs
3. Binary files
 - 3.1 Introduction to manipulating binary files.
 - 3.2 Reading and writing structured data using binary files.
4. Creating Libraries
 - 4.1 Importance and procedures for creating and using libraries in projects.
 - 4.2 Practical examples of code modularization using libraries.
 - 4.3 Preprocessor directives `#ifndef`, `#define` and `#endif`
5. Standard and Other Utility Libraries
 - 5.1 Exploring standard libraries such as `string.h`, `ctype.h`.
6. C# Graphical Interface with Windows Forms or WPF
 - 6.1 Introduction to creating a graphical interface using.
 - 6.2 Implementing basic graphical interface elements: windows, buttons, text fields, etc., using Windows Forms or WPF.
 - 6.3 Handling events and user interaction in the graphical interface.

19. Assessment Methods

The Supplementary Regulations on the Assessment of Knowledge and Competences currently in force shall apply. Continuous assessment shall obligatorily include oral interventions distributed throughout the teaching period and a final written assessment, both with a weighting factor of 3. It may also include individual or group assignments, with a weighting factor of 2, as well as other assessment components, in accordance with the terms and weightings established by the applicable regulations.

20. Didactic Resources

Lectures with the support of slides; Practical examples and exercises; Support material; Integrated development environment (IDE); Audiovisual resources; Computer lab; Online collaboration tools.

21. Sustainability Objectives

This course unit contributes to SDGs 4, 9, and 12 by promoting digital literacy, technological innovation, and good programming practices such as code reuse, modularization, and efficient resource use. The development of computational skills and problem-solving enhances students' preparedness to face digital challenges responsibly.



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22. Keywords

1. C programming
2. Binary files
3. Graphical interfaces
4. Modularization



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23. Main Bibliography

Author(s): Joseph Albahari
Title: C# 12 in a Nutshell: The Definitive Reference
Edition: 1st Edition Year: 2023
Local: Sebastopol, CA
Publisher: O'Reilly Media
ISBN Code: 978-1-0981-4744-0

Author(s): Damas, Luís Manuel Dias
Title: Linguagem C
Edition: 25.^a edição Year: 2025
Local: Lisboa
Publisher: FCA
ISBN Code: 978-972-722-945-1

Author(s): Brian W. Kernighan, Dennis M. Ritchie
Title: The C Programming Language
Edition: 2nd Edition Year: 1988
Local: Englewood Cliffs, NJ
Publisher: Prentice Hall
ISBN Code: 978-0-13-110362-7

24. Complementary Bibliography

Author(s): Loureiro, Henrique
Title: C++: Guia Moderno de Programação
Edition: 1 Year: 2019
Local: Lisboa
Publisher: FCA
ISBN Code: 978-972-722-904-8

Author(s): Stack Overflow on line community
Title: Stack Overflow - Where Developers Learn, Share, & Build Careers
Edition: Year:
Local: On-line
Publisher: <https://stackoverflow.com/>
ISBN Code:



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Ficha técnica MIP / MIP Datasheet	
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Autor / Author	Prof. Doutor RAUL EDUARDO CAPELA TELLO RATO
Classificação / Classification	-
Descritores / Descriptors	-
Colaborador(es) / Colaborator(s)	-
Data Hora / Date Time	
Formato de dados / Data Format	Texto / Text, PDF
Estatuto de utilização / Usage	Acesso público / Public Access
Relação / Relation	Version 1,0
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