

Course Unit	Programming Languages I	Field of study	Computer Science
Bachelor in	Informatics and Communications	School	School of Public Management, Communication and Tourism
Academic Year	2023/2024	Year of study	1
Type	Semestral	Semester	1
Workload (hours)	162	Contact hours	T - , TP 15, PL 45, TC - , S - , E - , OT 20, O -
		Level	1-1
		ECTS credits	6.0
		Code	9188-320-1104-00-23

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Ana Sofia da Fonte Pereira

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Develop algorithms that solve given problems efficiently; solve computing problems in effective ways.
2. Translate algorithms into programs, using a programming language;
3. Use good programming skills.

### Prerequisites

Before the course unit the learner is expected to be able to:

1. Understand formal and mathematical notations;
2. Solve simple linear equations.

### Course contents

Algorithms; General Programming Concepts; Preparation and execution of programs; Identifiers and reserved words; Elementary Data Types; Operations: arithmetic and logic; Decision and repetition structures; Vectors, strings and structs; Linear search and bubble sorting; Basics of pointers; Functions (parameters and scope); Libraries standard (string, h and math. h) and custom; Files, reading and writing.

### Course contents (extended version)

1. General concepts of problems decomposition and algorithms
  - Introduction to the concept of algorithm and structured programming;
  - Specification of an algorithmic language (natural language, pseudocode and flowchart);
2. Programming Basics (in C):
  - General concepts; Preparation and execution of a program.
  - Structure of a program, commonly used libraries and introduction to syntax c.
  - Elementary concepts: identifiers, reserved words;
  - Flow control structures: if . . else if . . else; for; do while; while.
  - Vectors, strings and structs.
  - Arrays searching and sorting.
  - Introduction to scorers.
  - Declaration and definition of functions.
  - Standard C libraries; custom libraries.
  - Reading and writing files.

### Recommended reading

1. Damas, Luís. Linguagem C, 24ª edição, FCA - Editora de Informática, 1999. ISBN: 978-972-722-156-1
2. Guerreiro, Pedro. Elementos de Programação com C, 3ª edição, FCA - Editora de Informática, 2006. ISBN: 978-972-722-510-1
3. Deitel, Paul; Deitel, Harvey M. . C: How to program, 8th edition, Deitel & Associates, Inc, Prentice-Hall, 2014. ISBN: 978-0133976892
4. Slides de suporte às aulas.

### Teaching and learning methods

Theoretical and practical: one part consisting of exposure to theoretical problems which arise and offer solutions followed by a part of problems and assignments to be held in class and in tutorial classes, which aims to consolidate the theoretical concepts discussed. Laboratory practice: lessons, which is shown through simulation and testing the concepts already developed.

### Assessment methods

1. Continuous Evaluation - (Regular, Student Worker) (Final)
  - Intermediate Written Test - 30% (Minimum grade: 7 points.)
  - Intermediate Written Test - 30% (Minimum grade: 7 points.)
  - Practical Work - 40% (Includes the completion of two projects. Minimum score of 7 points)
2. Final Evaluation - (Regular, Student Worker) (Supplementary, Special)
  - Final Written Exam - 100% (Written exam (theoretical part + practical part))

### Language of instruction

Portuguese, with additional English support for foreign students.

### Electronic validation

Ana Sofia da Fonte Pereira	Vítor José Domingues Mendonça	Anabela Neves Alves de Pinho	Luisa Margarida Barata Lopes
02-11-2023	06-11-2023	07-11-2023	09-11-2023