

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
Level	1-1	ECTS credits	6.0
Code	9188-320-1104-00-23		
Workload (hours)	162	Contact hours	T - , TP 15, PL 45, TC - , S - , E - , OT 20, O -

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