INSTITUTO POLITÉCNICO DE BRAGANÇA

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	2022/2023	Year of study	1	Level	1-1	ECTS credits	6.0						
Type	Semestral	Semester	1	Code	9188-320-1104-00-22								
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. Evaluation along the semester - (Regular, Student Worker) (Final)
   - Intermediate Written Test - 30% (Minimum grade: 8 points.)
   - Intermediate Written Test - 30% (Minimum grade: 8 points.)
   - Practical Work - 40% (Includes the completion of two projects. Minimum score of 8 points)
2. Written exam (theoretical part + practical part) - (Regular, Student Worker) (Supplementary, Special)

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

Ana Sofia da Fonte Pereira	Vítor José Domingues Mendonça	Elisabete da Anunciacao Paulo Morais	Luisa Margarida Barata Lopes
13-10-2022	16-11-2022	16-11-2022	21-11-2022