

ADVANCED DATA STRUCTURES

Degree in Computer Systems

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Degree in Electrical and Computer Engineering

Degree in Engineering and Development of Digital Games

Code: 10121

Main Scientific Area: Computer Science

Lecturer: João Carlos Cardoso da Silva

Language of Instruction: Portuguese

Regime: S2

Contact Hours: 60h Total Workload: 100h

ECTS: 6,0

Objectives

This curricular unit will consist of the fundamental concepts on programming with complex data structures.

Learning Outcomes

The students should be able to understand and analyze problems, and to plan and develop structured solutions inC programming language, using dynamic data structures.

Course Contents

1. Pointers

2. Dynamic Data Structures:

- Linked lists
- Hash Tables
- Binary search trees
- Graphs

Recommended Bibliography

- António Rocha, 2014. Estruturas de Dados e Algoritmos em C, 3a Edição, FCA. ISBN 978-9727227693.
- João Neto, 2014. Programação – Algoritmos e Estruturas de Dados, 3a Edição, Escolar Editora. ISBN978-9725924242.
- Stephen G. Kochan, 2014. Programming in C, 4th ed., Addison-Wesley Professional. ISBN 978-0321776419.

Learning and Teaching Methods

The syllabus was defined with the aim to give to the students the ability of learning models for dynamic data representation in an imperative programming language (C language). Thus, the presentation, exploration and application of data representation techniques is addressed in the course syllabus.

Assessment Methods

The evaluation consists of two practical components (CP1 and CP2), which are the development of computer programs, coded in C language, in order to solve a particular problem.

The final evaluation (NF) is given by the following formula:

$$NF = 40\% CP1 + 60\% CP2$$

$$NF = (40\% * CP1 + 60\% * CP2) * 85\% + (\text{Project } 50/10) * 15\% \text{ (LEIM)}$$

$$CP1 \geq 10; CP2 \geq 10$$