DATA STORAGE AND ACCESS

Degree in Computer Systems

Degree in Computer Systems

Degree in Electrical and Computer Engineering

Degree in Engineering and Development of Digital Games

Code: 10117

Main Scientific Area: Information Systems and Artificial Intelligence

Lecturer: Paulo Adriano Marques Sousa Teixeira

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 60h Total Workload: 100h

ECTS: 6,0

Objectives

Provide a set of technical and scientific knowledge related to database management systems and to prepare students for data modeling of a information system. Develop skills in the area of data manipulation in SQL including the use of procedures and functions.

Learning Outcomes

Analysis and data modeling;
Interpretation of a data model and its conversion to a database schema;
Management and data manipulation in a Database Management System (DBMS);
Using a data manipulation language;
Optimizing the performance of a DBMS;
Application development with support of a DBMS

Course Contents

1. Introduction to Databases

1.1. Historical perspective
1.2. Fundamental concepts
2. Data Modeling

2.1. Relational model
2.2. Data normalization and normal forms
2.3. Entity-Relationship Model
2.4. Non-relational models
3. Data manipulation

3.1. Set theory and relational algebra
3.2. Data manipulation language - SQL
4. Design and Database Optimization

4.1. Triggers
4.2. Stored procedures

4.3. Stored functions

Recommended Bibliography

Coronel, Carlos, Morris, Steven, Rob, Peter. (2018). Database systems: design, implementation, and management (13th ed.). Boston, Mass.: Course Technology/Cengage Learning

Ricardo, C. M., Urban, S. D. (2017). Databases Illuminated. BOOK, Jones Bartlett Publishers. 3rd Edition.

Learning and Teaching Methods

Point 1 of the program students contextualize the problems involved in the study area.
Section 2 will provide the theoretical basis for modeling and data analysis with emphasis on the relational schema without forgetting the non-relational models.
In point 3 beyond the theoretical aspects of relational algebra students will practice writing SQL code for data manipulation, in point 4 will be developed more complex applications with the introduction of other concepts for process optimization.

Assessment Methods

Two written tests (WT1, WT2);
Work on modeling (WM);
A work with application development database (WD)