Course Unit	Databases II			Field of study	Information Systems		
Bachelor in	Management Informatics			School	School of Technology and Management		
Academic Year	2023/2024	Year of study	2	Level	1-2	ECTS credits	6.0
Type	Semestral	Semester	2	Code	9186-709-2201-00-23		

Workload (hours)	162	Contact hours	T	-	TP	60	PL	-	TC	-	S	-	E	-	OT	-	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)	Carla Manuela Gomes Martins , João Paulo Ribeiro Pereira

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Learn the structure of PL/SQL blocks
2. Know the language PL/SQL
3. Make administrative tasks in Oracle XE
4. Project and develop applications in Oracle APEX
5. Understand different types of databases
6. Understand the concept of non-relational DBs (NoSQL data), working with semi-structured data from several sources

Prerequisites

Before the course unit the learner is expected to be able to:
Knowledge of SQL

Course contents

Unit 1: PL/SQL Language; Unit 2: ORACLE DB Administration and ORACLE APEX (Low code); Unit 3: Non-relational DBs (NoSQL data)

Course contents (extended version)

1. PL/SQL language
   - PL/SQL Concepts
   - SQL Statements in a PL/SQL block (SQL in PL/SQL)
   - Restricting Rows, Sorting Data, and Joining Data from Multiple Tables
   - Single-Row Functions and Group Functions (aggregate functions)
   - Subqueries
   - Control Structures and Exception Handling
   - Cursors (for Data Retrieval) and Advanced Data Types (Collections and Records)
   - Stored Procedures and Stored Functions
   - Packages and Views
   - Triggers
2. ORACLE DB Administration and ORACLE APEX
   - Administrative tasks (ORACLE XE)
   - Development of applications in ORACLE APEX
3. Non-relational DBs (NoSQL data)
   - Introduction to Non Relational Databases
   - Distribution of Data to manage large volumes of information - BigData
   - Development of Nonrelational Technologies
   - Introduction to MongoDB: Create, insert, search and remove documents. Aggregation Operations

Recommended reading

1. Oracle 11G: SQL 2nd Edition - "Joan Casteel" - 2010
2. Advanced Oracle PL/SQL Developer's Guide - Second Edition 2nd Edition - "Saurabh K. Gupta" - 2016
3. Beginning Oracle Database 11g Administration: From Novice to Professional - "Ignatius Fernandez" - 2009
4. Mastering Oracle SQL and SQL*Plus - "Lex deHaan" - 2015
5. MongoDB: The Definitive Guide: Powerful and Scalable Data Storage - "Shannon Bradshaw" - 2019

Teaching and learning methods

Theoretical and practical presential lessons, with extra learning tasks to be carried out in laboratory environment

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
   - Practical Work - 60% (ORACLE and NoSQL (MongoDB) Database Design and Implementation)
   - Final Written Exam - 40% (Minimum exam grade of 7 values)
2. Alternative 2 - (Regular, Student Worker) (Supplementary, Special)
   - Practical Work - 45% (ORACLE Database Design and Implementation)
   - Final Written Exam - 55% (Minimum exam grade of 7 values)

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

Carla Manuela Gomes Martins , João Paulo Ribeiro Pereira	Tiago Miguel Ferreira Guimaraes Pedrosa	José Carlos Rufino Amaro	Nuno Adriano Baptista Ribeiro
29-02-2024	14-03-2024	16-03-2024	16-03-2024

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