

Course Unit	Databases II	Field of study	Information Systems
Bachelor in	Informatics Engineering	School	School of Technology and Management
Academic Year	2023/2024	Year of study	2
Type	Semestral	Semester	2
Level	1-2	ECTS credits	6.0
Code	9119-706-2201-00-23		
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) João Paulo Ribeiro Pereira, Davide Emanuel da Silva Dias, Marisa Cristina Torrado Ortega, Reis Lima Quarteu

### 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 (Low Code)
  - 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 - "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

### 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

1. Portuguese
2. English

### Electronic validation

João Paulo Ribeiro Pereira	Tiago Miguel Ferreira Guimaraes Pedrosa	Luís Manuel Alves	José Carlos Rufino Amaro
17-03-2024	19-03-2024	19-03-2024	24-03-2024