![ipb INSTITUTO POLITÉCNICO DE BRAGANÇA]

| | | | | | | |
|---|---|---|---|---|---|---|
| Course Unit | Databases I | | | Field of study | Information Systems | |
| Bachelor in | Informatics Engineering | | | School | School of Technology and Management | |
| Academic Year | 2022/2023 | Year of study | 2 | Level | 1-2 | ECTS credits 6.0 |
| Type | Semestral | Semester | 1 | Code | 9119-706-2102-00-22 | |

| 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) | Leonel Domingues Deusdado, Reis Lima Quarteu |
|---|---|

## Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Have a global view of the databases development process
2. Know the evolutionary process and history of databases
3. Know the different techniques of modelling data.
4. Know the different types of physical implementation of databases
5. Know the structure and functions of a DataBase Management System
6. Know the diferent techniques for data standardization
7. Know and use the MySQL development environment
8. Know and use the Microsoft Access development environment

## Prerequisites

Before the course unit the learner is expected to be able to:
Not Applicable

## Course contents

Unit 1: Introduction to Database Environments; Unit 2: Database Management Systems; Unit 3: Data Normalization; Unit 4: Data Modeling; Unit 5: Relational Algebra and SQL - (MySQL); Unit 6: Microsoft Access

## Course contents (extended version)

1. Introduction to Database Environments
    - Concept of Information System
    - Information in Organizations
    - Information Technologies
    - Information Management
2. Database Management Systems
    - Approach and Advantages
    - DBMS Architecture
    - Users in a DBMS
3. Data Normalization
    - Concept of the Data Normalization Process
    - Functional Dependencies
    - Data Normalization techniques - Normal Forms
4. Data Modeling
    - Maintenance of Integrity
    - Redundancy and Keys
    - E-R Diagrams
    - Relational Model
5. Relational Algebra and SQL - (MySQL)
    - Concepts and Application of Relational Algebra
    - MySQL Administration Tools
    - DDL Commands
    - DML Commands
6. Microsoft Access
    - Access Environment
    - Advanced Tasks

## Recommended reading

1. SQL Fundamentals - John J. Patric - Prentice Hall - 2004
2. Desenhar Bases de Dados – Pedro Ramos - Edições Silabo – 2006
3. Access 2007: Bible - Machael R. Grab et Al. - Wiley Publishing - 2007
4. Fundamentos de Bases de Dados - Feliz Gouveia - Editora FCA - 2014
5. Diapositivos e Sebenta da Unidade Curricular BD1 - 2022/2023

## 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, Supplementary)
    - Final Written Exam - 60% (Required Minimal Grade: 7 values)
    - Practical Work - 40%
2. Alternative 2 - (Regular, Student Worker) (Special)
    - Final Written Exam - 100%

## Language of instruction

1. Portuguese
2. English

## Electronic validation

| Leonel Domingues Deusdado | José Luís Padrão Exposto | Luísa Maria Garcia Jorge | Paulo Alexandre Vara Alves |
|---|---|---|---|
| 11-10-2022 | 12-10-2022 | 15-10-2022 | 24-10-2022 |