

<b>POLI</b> ESCOLA SUPERIOR TECNOLOGIA GESTÃO <b>TÉCNICO</b> <b>GUARDA</b>	<b>SUBJECT DESCRIPTION</b>	<b>MODELO</b> PED.013.03
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<i>Course</i>	<b>Computer Science</b>					
<i>Subject</i>	<b>Databases I</b>					
<i>Academic year</i>	2023/2024	<i>Curricular year</i>	2nd	<i>Study period</i>	1st semester	
<i>Type of subject</i>	Compulsory	<i>Student workload (H)</i>	Total: 140	Contact: 75	<i>ECTS</i>	5
<i>Professor(s)</i>	Prof. Doutor José Carlos Fonseca					
<input checked="" type="checkbox"/> <i>Area/Group Coordinator</i> <input type="checkbox"/> <i>Head of Department</i>	Profª. Doutora Maria Clara Silveira					

## PLANNED SUBJECT DESCRIPTION

### 1. LEARNING OBJECTIVES

Upon completion of the UC, students should be able to:

1. Develop Oracle databases with security in a concurrent environment
2. Manipulate and query databases using SQL
3. Program procedures, functions and triggers in the PL/SQL language

### 2. PROGRAMME

1. Introduction to databases
2. Database conceptual model
  - a. Entity-relationship model
  - b. Normalisation
  - c. Denormalisation
3. Programming in SQL
  - a. Table and view manipulation
  - b. Data integrity
  - c. Operations
  - d. Operators
  - e. Sorting

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- f. Functions
  - g. Sub queries
  - h. Data aggregation
- 4. Transaction and locking
  - a. Transactions and concurrency control
  - b. Locking
- 5. Indexing
- 6. Security
  - a. Users and quotas
  - b. Privileges e Roles
- 7. Programming in a procedural language for data manipulation
  - a. Structure and organization
  - b. Variable declaration
  - c. Database interaction
  - d. Flux control
  - e. Cursors
  - f. Procedures
  - g. Functions
  - h. Triggers

### 3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

1. Contents 1, 2, 4, 5 and 6 are consistent with Objective 1 because they focus on the characteristics of databases and their evolution, the development of Oracle databases starting from the ER logic model, the use of normalization and denormalization, the logical and physical

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database structures and processes, transactions in a concurrent environment, indexing and security in the management of users and privileges

2. Content 3 is consistent with Objective 2 because the SQL language is taught with a focus on the creation and management of the database and data query
3. Content 7 is consistent with Objective 3 because the procedural native language of Oracle databases, PL/SQL, is taught as well as its use in developing code for procedures, functions and triggers in order to efficiently access database data

#### 4. MAIN BIBLIOGRAPHY

Mandatory:

1. Lecture notes provided by the teachers
2. Groff, J., Weinberg, P., Using SQL, McGraw-Hill, 1990
3. Campos, L., Oracle 8i - Curso Completo, FCA, 1998

Recommended:

4. Ramklass, R., OCA Oracle Database 12c SQL Fundamentals I Exam Guide (Exam 1Z0-061), Oracle Press, 2014
5. Oracle, Oracle Manuals, available online in <http://www.oracle.com/technetwork/indexes/documentation/index.html>
6. Pepin, D., Oracle Programmer's Guide, QUE, 1990
7. Loney, K., Bryla, B., Oracle Database 11g DBA handbook, Oracle Press, 2008
8. Pereira, J., Tecnologias de Bases de Dados, FCA, 2001
9. Feuerstein, S., Pribyl, B., Oracle PL/SQL Programming, O'Reilly, 2009

#### 5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Teaching methodologies:

1. Active learning
2. Lecture

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3. Interactive lesson
4. Problem solving
5. Project

The evaluation for the continuous evaluation period is as follows:

- 100% (20 points) - Activities carried out during classes, most of which involve the development of the group practical work that will be carried out throughout the semester. Students with worker-student status will have to carry out these activities, even outside of class, in order to be evaluated in this component.

Evaluation methodology for all the other evaluation periods:

- 100% (20 points) - Written practical exam of 2 hours, on a test sheet, with questions covering various phases of the project development and theoretical questions, on a date scheduled by the ESTG board.

## 6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

1. Active Learning is consistent with the objectives, as students develop collaborative skills, step out of their comfort zone in exposing their analysis and thinking, increase their interest in the subject, improve critical and creative thinking, increase the understanding and retention of what they learned.
2. Lectures are consistent with the objectives due to the need to provide students with the theoretical contents, including the various aspects related to the development of databases and SQL and PL/SQL languages
3. Interactive Lessons are consistent with the objectives since student/teacher interaction helps with learning the concepts of the program and the introduction of new ideas, perspectives and solutions that can be applied both in the analysis and implementation of databases as well as in the study of different strategies for developing code
4. Problem solving is consistent with the objectives since the application of theoretical concepts to solve true to life practical exercises related to the study, research and manipulation of databases in a concurrent environment and in the development of PL/SQL software helps consolidate the concepts, highlighting the students' expertise

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5. Project development is consistent with the objectives since it covers the development of a database, through all stages from its conception to its use, requiring the practical application of all concepts covered throughout the semester to a realistic and new situation

## 7. ATTENDANCE

The student is required to attend at least 1/2 of the classes in order to be evaluated during the continuous assessment period. Students with worker-student status are not required to attend.

## 8. CONTACTS AND OFFICE HOURS

José Carlos Fonseca - josefonseca@ipg.pt - Office # 25

Office hours:

Monday 09:00 – 11:00

Tuesday 13:00 – 14:00

Thursday 13:00 – 14:00

Friday 13:00 – 14:00

**DATE**

**18 de setembro de 2023**

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## SIGNATURES

Professor

(José Carlos Coelho Martins da Fonseca)

Area Coordinator

(Mara Clara Santos Pinto Silveira)