SUBJECT DESCRIPTION					**MODELO** PED.013.03	

Course	**Computer Science Engineering**					
Subject	**Databases II**					
Academic year	2023/2024	*Curricular year*	3º	*Study period*	2nd semester	
Type of subject	Compulsory	*Student workload (H)*	Total: 168	Contact: 75	*ECTS*	6
Professor(s)	José Carlos Fonseca, PhD					

☒ *Area/Group Coordinator* ☐ *Head of Department*	*(select)*	Maria Clara Silveira, PhD

PLANNED

1. LEARNING OBJECTIVES

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

1. Analyse the Multidimensional Model for strategic decision support

2. Develop Data Warehouses

3. Manage and maintain data warehouses

2. PROGRAMME

1. Review of basic concepts of Databases

    a. The relational model

    b. Normalization and Denormalization

    c. SQL

    d. PL/SQL

    e. Transactions and concurrency control

3. The Multidimensional Model

    a. Databases for decision support

    b. The architecture of databases in an organization

    c. The multidimensional model

    d. The star model, facts and dimensions

   e.   Extraction, Transformation and Loading (ETL)

   f.   Granularity, density and sparsity

   g.   Detailed study of a chain of stores

   h.   Simplified calculation of the space occupied

   i.   Multiple stars

   j.   Exploration of Information and OLAP

2. The design and development processes of a Data Warehouse

   k.   Steps in building a Data Warehouse

   l.   Large dimensions, Snowflakes, Mini-dimensions

   m.   Changing dimensions

   n.   Study of the star models of a warehouse and a bank

   o.   Factless fact tables

3. Management and Maintenance of Data Warehouses

   p.   Using the Discoverer

   q.   RAID disks

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

1. Contents 1 and 2 are consistent with Objective 1 because they focus key aspects of operational databases to introduce multidimensional databases to strategic decision support.

2. Content 3 is consistent with Objective 2 because it focus on the development process of data warehouses and strategies for solving common problems.

3. Content 4 is consistent with Objective 3 because it focuses on the management and maintenance of data warehouses, along with the optimization of their performance.

4. MAIN BIBLIOGRAPHY

Mandatory:

1. Lecture notes provided by the teachers

2. Caldeira, C., Data Warehousing: conceitos e modelos, Edições Sílabo, ISBN 978-972-618-479-9, 2008

3. Elmasri, R., Navathe, S., Fundamentals of database systems, 5th edition, Addison-Wesley, ISBN 0-321-41506-X, 2007

4. Oracle, Manuais do Oracle, online em http://www.oracle.com/technetwork/indexes/documentation/index.html

5. Campos, L., Oracle 8i - Curso Completo, FCA, 1998

Recommended:

6. Ralph Kimball, Laura Reeves, Margy Ross, Warren Thornthwaite, The Data Warehouse Lifecycle Toolkit: Expert Methods for Designing, Developing, and Deploying Data Warehouses, John Wiley & Sons, ISBN 0471255475, 2001

7. Pepin, D., Oracle Programmer's Guide, QUE, 1990

8. Loney, K., Bryla, B., Oracle 10g DBA handbook, Oracle Press, 2005

9. Feuerstein, S., Pribyl, B., Oracle PL/SQL Programming, O'Reilly, 2009

10. Ramakrishnan, R., Gehrke, J., Database Management Systems, Third Edition, McGraw-Hill, 2007

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Teaching methodologies:

1. Active learning

2. Lecture

3. Interactive lesson

4. Problem solving

5. Project

The evaluation for the continuous evaluation period is as follows:

- 75% (15 points) - Activities carried out during classes, most of which involve the development of the individual 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.

- 25% (5 points) - Delivery of the report in pdf and an evaluation checklist in xlsx, related to the practical work, its presentation and defense, which will take place in person in the last week of classes. Students with the worker-student status will be able to make their presentation and defense remotely, if they are unable to do so in person.

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.

The evaluation methodology was submitted to the competent bodies of the ESTG-IPG, according to the regulations.

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 multidimensional model, the development of datawarehouses, their maintenance and management.

3. Interactive Lessons are consistent with the objectives since student/teacher interaction helps with learning the concepts of the programme and the introduction of new ideas, perspectives and solutions that can be applied both in the analysis and implementation of datawarehouses, in its manipulation and in the study of different strategies for their development, maintenance and management.

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 datawarehouses helps consolidate the concepts, highlighting the student's expertise.

5. Project development is consistent with the objectives since it covers the development of a datawarehouse, 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

Professor José Carlos Fonseca, PhD

josefonseca@ipg.pt

Office # 25

Office hours:

Tuesday 17:00 – 18:30

Thursday 12:00 – 13:00

DATE

18 de fevereiro de 2024

SIGNATURES

Professor

(signature)

Area Coordinator

(signature)