Course Title:	**Database management systems**
Course Code:	CSE431
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. SAAD mohamed Elfahdel
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **3 (1.5-0-1.5)**
2. Course type **a.** College ☐ Department ■ Others ☐ **b.** Fundamental ■ Transversal ☐ Optional ☐
3. Level/year at which this course is offered: 2.2/3
4. Pre-requisites for this course (if any): CSE323, CSE131, CSE212, CSE332

1. **Mode of Instruction** (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	33	78
2	**Blended**	…..		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other (Project)**	45		

2. **Contact Hours** (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	-
2	**Laboratory/Studio**	-
3	**Tutorial**	-
4	**Others**(Project)	45
	Total	45

B. Course Objectives and Learning Outcomes

Course Description

This course delves into database management systems (DBMS) with a particular focus on Oracle and the PLSQL programming language. Students will learn to design, program, and manage databases through concepts such as control structures, cursors, exception handling, stored procedures, packages, and triggers. The course combines theory and practical exercises to develop skills applicable to real-world projects. By the end of the course, students will be able to solve complex database-related problems and master advanced DBMS functionalities. This course also prepares students to work efficiently in professional database environments.

Course Main Objectives

- ✓ Gain a comprehensive understanding of database management systems, their architectures, and functionalities.
- ✓ Familiarize with Oracle DBMS and the PLSQL programming language.
- ✓ Master control structures, cursors, exception handling, and modular programming with sub-programs.
- ✓ Learn to design and manage stored procedures, packages, and triggers for efficient database operations.
- ✓ Apply theoretical knowledge and practical skills to solve complex, real-world database problems.
- ✓ Equip students with the technical expertise to work in professional database systems and meet industry standards.

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	✓ Demonstrate a strong foundational knowledge of database management systems, including their architectures, components, and evolution.	PLO.K1
1.2	✓ Understand advanced PLSQL concepts, including control structures, cursors, stored procedures, and triggers.	
2	**Skills**	
2.1	✓ Effectively communicate complex database solutions and present findings from practical exercises and real-world scenarios.	PLO.S2
2.2	✓ Solve database-related problems by applying theoretical knowledge and advanced programming skills in PLSQL.	
2.2	✓ Manage the implementation and optimization of database projects using agile methodologies.	PLO.S5
2.3	✓ Design and execute database solutions, integrating advanced features like exception handling, triggers, and packages, in a structured and efficient manner.	

C. Course Content

No	List of Topics	Contact Hours
1	**Chapter 1: Introduction to PL/SQL** 1. Introduction 2. Overview of Oracle 3. The SQL Language 4. Introduction to PL/SQL 5. PL/SQL Environment	3
2	**Chapter 2: Developing a Simple PL/SQL Block** 1. Structure of a PL/SQL Program 2. Syntax Rules of a PL/SQL Block 3. Data Types and Declarations 4. Variable Declaration 5. Constant Declaration 6. DBMS_OUTPUT Package 7. Assignment and Expressions 8. Nested Blocks and Scope of Objects 9. Debugging Tools	3
3	**Chapter 3: Control Structures** 1. Overview 2. Logical Conditions 3. Conditional Processing 4. Looping Structures 5. Sequential Control Structures.	3
4	**Chapter 4: Composite Data Types** 1. Overview 2. RECORD Data Type 3. Collection Data Type	3
4	**Chapter 5: Cursors** 1. Overview 2. Implicit Cursors 3. Explicit Cursors 4. Cursor Attributes 5. Cursors and Records 6. FOR UPDATE Cursors 7. Parameterized Cursors 8. Cursor FOR Loop 9. Cursor Variables	3
5	**Chapter 6: Exception Handling** 1. Overview	3

	2. Error Management 3. Exception Handling Principles 4. Predefined Oracle Exception 5. User-Defined Exceptions 6. RAISE_APPLICATION_ERROR Procedure 7. Exception Propagation 8. EXCEPTION_INIT Pragma 9. Error Handling Functions	
6	**Chapter 7: Subprograms** 1. Overview 2. Procedures 3. Functions 4. Recursion **5.** Managing Subprograms	3
	Chapter 8: Triggers 1. Overview 2. DML Triggers 3. System Triggers **4.** Trigger Management	3
	Chapter 9: Packages 1. Overview 2. Developing a Package 3. Package Management **4.** Oracle Built-in Packages	3
Total		30

No	List of pratical wok	Contact Hours
1	Workshop 1 -- Developing a simple PL/SQL block	3
	Workshop 2 -- Conditional processing and repetitive processing	3
2	Workshop 3 -- Cursors	3
3	Workshop 4 -- Exceptions	3
4	Workshop 5 -- Subprograms	3
5	Workshop 6 -- Triggers	3
Total		18

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
PLO.K1	✓ Demonstrate a strong foundational	- Class discussions	Assignments,

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	knowledge of database management systems, including their architectures, components, and evolution. ✓ Understand advanced PLSQL concepts, including control structures, cursors, stored procedures, and triggers.	- Assignments - Projects	Quizzes, Report
2.0	**Skills**		
PLO.S1	✓ Effectively communicate complex database solutions and present findings from practical exercises and real-world scenarios. ✓ Solve database-related problems by applying theoretical knowledge and advanced programming skills in PLSQL.	- Class discussions - Assignments - Projects	Assignments, Quizzes, presentation
PLO.S5	✓ Manage the implementation and optimization of database projects using agile methodologies. ✓ Design and execute database solutions, integrating advanced features like exception handling, triggers, and packages, in a structured and efficient manner.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	25%
2	Tirme mid 1	Random	25%
3	Exam	16th	50%

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
- Office hours - Blackboard interface - Academic advisor - Bibliotic

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1. H. Garcia-Molina, J.D.Ullman, J. Widom : Database System Implementation, Prentice Hall, 2000 2. Date, Database Systems, 8th edition, 2004 3. Patrick Valduriez M. TamerOzsu, Principles of Distributed Database Systems, 2nd Edition, Prentice Hall, 1999. 4. Oracle PL/SQL Programming by Steven Feuerstein and Bill Pribyl, O'Reilly Media. 5. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan.
Essential References Materials	• Oracle Database
Electronic Materials	1. Oracle Official Documentation: PL/SQL Developer's Guide – docs.oracle.com 2. Oracle Learning Library: PL/SQL Tutorials – Oracle Live SQL 3. Udemy & Coursera: PL/SQL Programming Courses (www.udemy.com, www.coursera.org) **4.** YouTube Channels: Oracle Developers, Database Star, RebellionRider, and The Pragmatic Programmer
Other Learning Materials	

2. Facilities Required

Item	**Resources**
Accommodation	**Classroom board** **Computer lab with the necessary software** **Internet access**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2024