



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

COURSE CONTENT

DATABASE PROGRAMMING WITH PL/SQL								
I Semester: CSE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
2515805	Foundation	3	0	0	3	40	60	100
		Contact Classes: 45			Tutorial Classes: Nil			Practical Classes: Nil
						Total Classes: 45		
Prerequisites: Basic understanding of programming concepts along with fundamental database concepts & SQL.								

Course Overview:

This course introduces database programming concepts using Procedural Language/Structured Query Language (PL/SQL) in the context of relational database management systems. It focuses on integrating SQL with procedural constructs to design, develop, and manage efficient database-driven applications.

Course Objectives:

1. To understand the fundamentals of SQL and PL/SQL programming concepts.
2. To develop PL/SQL programs using variables, control structures, cursors, and exception handling.
3. To design and implement functions, procedures, and packages for database applications.
4. To apply collections, bulk operations, and transaction management for efficient data processing.
5. To create and manage database triggers for automation, auditing, and data integrity enforcement.

Course Outcomes: After Completion of the Course, Students should be able to

1. Apply PL/SQL block structures, variables, control statements, and exception handling to solve problems.
2. Design collections and bulk operations for efficient data processing in e-commerce transactions.
3. Develop functions and procedures with proper transaction handling and parameter passing business logic modules of ERP systems.
4. Construct and manage PL/SQL packages with appropriate definer, invoker rights for components of inventory, payroll systems.
5. Make use of triggers to automate database events for auditing financial transactions and enforcing data integrity in databases.

UNIT - I: PL/SQL Basics

Block Structure, Behavior of Variables in Blocks, Basic Scalar and Composite Data Types, Control Structures, Exceptions, Bulk Operations, Functions, Procedures, and Packages, Transaction Scope

UNIT - II: Language Fundamentals & Control Structures

Lexical Units, Variables and Data Types, Conditional Statements, Iterative Statements, Cursor Structures, Bulk Statements, Introduction to Collections, Object Types: Varray and Table Collections, Associative Arrays, Oracle Collection API

UNIT - III: Functions and Procedures

Function and Procedure Architecture, Transaction Scope, Calling Subroutines, Positional Notation, Named Notation, Mixed Notation, Exclusionary Notation, SQL Call Notation, Functions, Function Model Choices, Creation Options, Pass-by-Value Functions, Pass-by-Reference Functions, Procedures, Pass-by-Value Procedures, Pass-by-Reference Procedures, Supporting Scripts.

UNIT – IV:

Package Architecture, Package Specification, Prototype Features, Serially Reusable Precompiler Directive,

Variables, Types, Components: Functions and Procedures, Package Body, Prototype Features, Variables, Types, Components: Functions and Procedures, Definer vs. Invoker Rights Mechanics, Managing Packages in the Database Catalog, Finding, Validating, and Describing Packages, Checking Dependencies, Comparing Validation Methods: Timestamp vs. Signature.

UNIT – V:

Introduction to Triggers, Database Trigger Architecture, Data Definition Language Triggers, Event

Attribute Functions, Building DDL Triggers, Data Manipulation Language Triggers, Statement-Level Triggers, Row-Level Triggers, Compound Triggers, INSTEAD OF Triggers, System and Database Event Triggers, Trigger Restrictions, Maximum Trigger Size, SQL Statements, LONG and LONG RAW Data Types.

TEXT BOOKS:

1. Oracle Database 12c PL/SQL Programming Michael McLaughlin, McGraw Hill Education.

REFERENCE BOOKS:

1. Benjamin Rosenzweig, Elena Silvestrova Rakhimov, Oracle PL/SQL by example Fifth Edition.
2. Dr. P. S. Deshpande, SQL & PL / SQL for Oracle 11g Black Book.

ELECTRONIC RESOURCES:

1. <https://hackr.io/tutorial/oracle-plsql-tutorial-for-beginners>
2. <https://www.udemy.com/course/oracle-plsql-tutorial/>
3. <https://www.learnvern.com/pl-sql-tutorial>
4. <https://www.tecklearn.com/course/oracle-pl-sql-training/>

MATERIALS ONLINE:

1. Course template
2. Tutorial question bank
3. Tech talk and Concept Video topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper – II
9. Lecture notes
10. E-Learning Readiness Videos (ELRV)