



# SMART FUTURE POINT<sup>®</sup>

(A unit of SFP Education & Technology Pvt. Ltd.)

TRAINING | PLACEMENT | SERVICES

## Course: 'Oracle Database (PL/SQL) Development'

**Fee:** Rs.75000

**Duration:** 6month

**Syllabus:-**

### Module 1: Introduction to Oracle Database & SQL

- What is Oracle Database?
- Introduction to SQL and Relational Databases
- Installing Oracle Database and SQL Developer
- Understanding Schema, Tables, and Data Types
- Writing & Executing SQL Queries

### Module 2: Basic SQL Queries

- SELECT Statement & Column Aliases
- Filtering Data with WHERE Clause
- Using Logical Operators (AND, OR, NOT)
- Sorting Results with ORDER BY
- Using DISTINCT to Remove Duplicates

### Module 3: SQL Functions

- String Functions (UPPER, LOWER, CONCAT, SUBSTR)
- Number Functions (ROUND, CEIL, FLOOR)
- Date Functions (SYSDATE, TO\_CHAR, ADD\_MONTHS)
- Aggregate Functions (SUM, AVG, COUNT, MIN, MAX)
- Using GROUP BY & HAVING Clause

### Module 4: Joins & Subqueries

- Types of Joins: INNER, LEFT, RIGHT, FULL
- Self Joins & Cross Joins
- Using Subqueries in SELECT, WHERE, FROM Clause
- Correlated Subqueries vs. Nested Subqueries

### Module 5: Data Manipulation Language (DML)

- Inserting Data into Tables (INSERT)
- Updating Data (UPDATE)
- Deleting Records (DELETE, TRUNCATE)
- Using MERGE for Upserts

### Module 6: Data Definition Language (DDL)

- Creating and Modifying Tables (CREATE, ALTER, DROP)
- Understanding Data Types and Constraints (PRIMARY KEY, FOREIGN KEY, UNIQUE, CHECK, NOT NULL)
- Working with Indexes for Performance Optimization
- Using Sequences and Synonyms

## Module 7: Views & Materialized Views

- Creating and Using Views
- Updating Data through Views
- Materialized Views vs. Regular Views
- Refreshing Materialized Views

## Module 8: Advanced SQL Features

- Using CASE & DECODE Statements
- Using Common Table Expressions (WITH Clause)
- Hierarchical Queries with CONNECT BY & START WITH
- Using Pivot & Unpivot for Data Transformation

## Module 9: Transactions & Concurrency Control

- Understanding Transactions (COMMIT, ROLLBACK, SAVEPOINT)
- Implementing ACID Properties
- Handling Deadlocks & Locks (ROW LOCK, TABLE LOCK)
- Managing Sessions and Connections

## Module 10: Introduction to Oracle SQL & PL/SQL

- Overview of Oracle Database & SQL
- Introduction to PL/SQL: What & Why?
- PL/SQL Architecture & Execution Model
- Installing Oracle Database & SQL Developer
- Writing & Executing PL/SQL Programs

## Module 11: PL/SQL Basics

- PL/SQL Block Structure (Anonymous Blocks)
- Variables, Data Types & Constants

- Control Structures (IF, CASE, LOOP, WHILE)
- Handling User Input with Bind Variables
- SQL Queries in PL/SQL (SELECT, INSERT, UPDATE, DELETE)

## Module 12: Cursors in PL/SQL

- Implicit vs. Explicit Cursors
- Cursor Attributes (%FOUND, %NOTFOUND, %ROWCOUNT)
- Working with Explicit Cursors (DECLARE, OPEN, FETCH, CLOSE)
- Cursor FOR Loop & Parameterized Cursors
- REF Cursors & Cursor Variables

## Module 13: Exception Handling in PL/SQL

- Types of Exceptions (Predefined, User-defined)
- Handling Exceptions using **EXCEPTION** Block
- Raising Exceptions with **RAISE** & **RAISE\_APPLICATION\_ERROR**
- Logging Errors for Debugging

## Module 14: Stored Procedures & Functions

- Creating & Executing Stored Procedures
- Parameterized Procedures (IN, OUT, IN OUT)
- Creating User-defined Functions
- Function vs. Procedure: Key Differences

## Module 15: Packages in PL/SQL

- Creating Packages (Specification & Body)
- Private vs. Public Components in a Package
- Overloading Procedures & Functions
- Package Initialization & Best Practices

## Module 16: Triggers in PL/SQL

- Introduction to Database Triggers
- Types of Triggers (Before, After, Row-Level, Statement-Level)
- Implementing DML Triggers (INSERT, UPDATE, DELETE)
- Auditing & Logging with Triggers

## Module 17: Collections in PL/SQL

- Introduction to PL/SQL Collections
- Types: Associative Arrays, Nested Tables, VARRAYs
- Collection Methods (COUNT, FIRST, LAST, EXTEND)
- Bulk Processing with **FORALL & BULK COLLECT**

## Module 18: Dynamic SQL & Performance Optimization

- Using **EXECUTE IMMEDIATE** for Dynamic SQL
- Working with DBMS\_SQL Package
- Optimizing PL/SQL Code for Performance
- Analyzing Execution Plans & Indexing Strategies

## Module 19: Advanced PL/SQL Features

- Using Oracle PL/SQL Built-in Packages (DBMS\_OUTPUT, DBMS\_JOB, DBMS\_SCHEDULER)

- Working with Autonomous Transactions
- Implementing Object Types in PL/SQL
- Using PL/SQL to Generate XML & JSON

## Module 20: PL/SQL Testing & Debugging

- Debugging PL/SQL Code in SQL Developer
- Writing & Running Test Cases with DBMS\_UTL
- Using PL/SQL Profiler for Performance Tuning

## Module 21: Real-world Applications & Project

- Developing a Complete Database-Driven Application
- Implementing Security & Access Control in PL/SQL
- Best Practices for Writing Maintainable PL/SQL Code
- Deploying PL/SQL Code in a Production Environment

## Who Should Take This Course?

- Beginners interested in **Oracle SQL & PLSQL Database Management**
- Developers & Data Analysts working with **Oracle Databases**
- Professionals preparing for **Oracle SQL Certification (1Z0-071)**

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