SQL PLSQL Developer Course Outline (Oracle)

# Basic SQL 16 classes

## Oracle 11g Database Configuration – 1 class

 Installing Oracle 11g

Configuring Oracle Users and Roles



 Configuring the Sample Database

## RDBMS and SQL – 1 class

 Database Management System (DBMS)

Relational Database Management System (RDBMS)



 Structured Query Language (SQL)

## Data Types and Constraints – 2 classes

 Oracle Data Types (CHAR, VARCHAR2, NUMBER, DATE, BLOB)

 Implicit and Explicit Data Type Conversion

 Types of Constraints (NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK)

 Defining and Modifying Constraints

## DDL (Data Definition Language) – 1 class

CREATE  ALTER



 DROP

 RENAME

 TRUNCATE

## DML (Data Manipulation Language) – 1 class

INSERT



UPDATE



 DELETE

## TCL (Transaction Control Language) – 1 class

COMMIT



 ROLLBAC

SAVEPOINT



## DRL (Data Retrieval Language) - SELECT – 2 classes

Basic SELECT Query



 Using WHERE Clause

Sorting Results with ORDER BY



 Filtering Data with DISTINCT

Limiting Results with ROWNUM and FETCH



## Single Row Functions – 4 classes

String Functions (e.g., CONCAT, LENGTH, SUBSTR, INSTR)



 Numeric Functions (e.g., ROUND, CEIL, FLOOR, MOD)

 Date Functions (e.g., SYSDATE, ADD\_MONTHS, TO\_DATE)

Conversion Functions (e.g., TO\_CHAR, TO\_NUMBER, TO\_DATE)



 NULL-related Functions (e.g., NVL, COALESCE, NULLIF)

## Aggregate Functions – 1 class

COUNT



 SUM

AVG



 MAX

 MIN

 Using GROUP BY and HAVING with Aggregate Functions

## Joins – 2 classes

 INNER JOIN

OUTER JOIN (LEFT, RIGHT, FULL)



 CROSS JOIN

 SELF JOIN

# Advanced SQL 14 classes

## Pseudo Column – 1 class

ROWNUM



 ROWID

SYSDATE



 LEVEL

 CURRVAL and NEXTVAL (for Sequences)

## Advanced DML – 2 classes

INSERT ALL



 UPDATE ALL

MERGE (Upsert Operation)



 UPDATE with JOIN

DELETE with JOIN



## Subqueries – 3 classes

 Single-row Subquery

Multiple-row Subquery



 Correlated Subquery

 Nested Subquery

 Subquery in SELECT, WHERE, and FROM clauses

## SET Operators – 1 class

 UNION

UNION ALL



INTERSECT



 MINUS

Differences between UNION and UNION ALL



## Analytical (Window) Functions – 2 classes

ROW\_NUMBER()



 RANK()

DENSE\_RANK()



 NTILE()

 LEAD() and LAG()

FIRST\_VALUE() and LAST\_VALUE()



 PERCENT\_RANK()

## Conditional Statements – 1 class

 CASE Statement

 DECODE Function

 NVL (as a conditional function)

## Views – 2 class

Creating Views



 Updating Views

 Dropping Views

 Materialized Views

 Advantages and Limitations of Views

## Sequences – 1 class

 Creating Sequences

Using Sequences with NEXTVAL and CURRVAL



 Alter and Drop Sequences

## Synonyms – 1 class

 Creating Synonyms

Using Public and Private Synonyms



 Dropping Synonyms

 Advantages of Synonyms in SQL Queries

# PLSQL 34 classes

## Getting Started with PL/SQL – 1 class

 Introduction to PL/SQL

PL/SQL Block Structure (DECLARE, BEGIN, EXCEPTION, END)



 PL/SQL vs SQL

 Writing and Executing Simple PL/SQL Programs

## Flow Control (Conditional Statements) – 1 class

IF-THEN-ELSE



 CASE

GOTO



 NULL

## Flow Control (Iterative Statements) – 1 class

 LOOP

WHILE LOOP



 FOR LOOP

 EXIT and CONTINUE Statements

## SELECT INTO – 1 class

Using SELECT INTO for Variable Assignment



 Selecting into Record Variables

Handling Multiple Rows with SELECT INTO



 Common Errors with SELECT INTO

## Exceptions – 2 classes

 Predefined Exceptions

User-defined Exceptions



 EXCEPTION\_INIT

Handling Exceptions with RAISE and RAISE\_APPLICATION\_ERROR



 Exception Propagation

## Cursors – 2 classes

Implicit Cursors



 Explicit Cursors

Cursor FOR Loops



 Cursor Variables

Handling Cursor Exceptions



## Records – 2 classes

 Declaring a Record Type

Using Records with SELECT INTO



 %ROWTYPE vs %TYPE

 Manipulating Record Values

## Procedures – 3 classes

Creating and Calling Procedures



IN, OUT, and INOUT Parameters



 Procedure Overloading

Handling Exceptions in Procedures



 Dropping and Altering Procedures

## Functions – 2 classes

 Creating and Calling Functions

IN and OUT Parameters in Functions



 Function Overloading

Returning Values from Functions



Dropping and Altering Functions



 Procuedure vs Functions

## Packages – 3 classes

 Creating and Using Packages

Package Specification vs Package Body



Public and Private Procedures/Functions



 Package Initialization

 Package State (Global Variables)

 Advantages of Packages over Procedures and Functions

## Triggers – 2 classes

 Creating Triggers

Types of Triggers (BEFORE, AFTER, INSTEAD OF)



 Row-Level vs Statement-Level Triggers

 Compound Triggers

 Trigger Timing and Order

 Disabling and Dropping Triggers

## Collections – 3 classes

Types of Collections (Associative Arrays, Nested Tables, VARRAYs)



 Creating and Using Collections

 Manipulating Collection Data

Collection Methods (COUNT, EXISTS, FIRST, LAST)



## Bulk Collect – 2 classes

Using BULK COLLECT to Fetch Data into Collections



 LIMIT Clause in BULK COLLECT

Performance Benefits of BULK COLLECT



 Handling Exceptions with BULK COLLECT

 Fetching Multiple Collections in One Query

 Using FORALL with BULK COLLECT for Efficient DML Operations

## Dynamic SQL – 2 classes

Introduction to Dynamic SQL



 EXECUTE IMMEDIATE

Using Bind Variables with Dynamic SQL



 Building Dynamic SQL for DML and DDL

 Executing Dynamic SQL with RETURNING INTO

## Table Functions – 2 classes

Creating and Using Table Functions



 Returning a Table from a Function

 Using Table Functions in SQL Queries

## Objects – 2 classes

Creating and Using Object Types



 Methods in Object Types

Using Objects in Tables (Object-Relational Features)



 Managing Object Type Dependencies

## Database Links – 1 class

 Creating Database Links

Using Database Links in Queries



 Managing Database Links

 Performance Considerations

## Autonomous Transactions – 2 classes

 Using PRAGMA AUTONOMOUS\_TRANSACTION

 When to Use Autonomous Transactions

COMMIT and ROLLBACK inside Autonomous Transactions



 Performance Considerations

# Performance Tuning 16 classes

## Read an Execution Plan – 2 class

Understanding the Execution Plan



 How to Generate an Execution Plan

Interpreting Execution Plan Outputs



 Using EXPLAIN PLAN

## Database Statistics – 2 class

 Collecting Database Statistics

Viewing and Interpreting Statistics



 Using DBMS\_STATS

Automatic vs Manual Statistics Collection



 Analyzing and Tuning Based on Statistics

## Query Performance – 2 class

 Identifying Slow Queries

 Optimizing Query Execution

Using Hints for Query Optimization



 Common Query Performance Pitfalls

 Analyzing Query Performance with EXPLAIN PLAN

## Create Indexes – 1 class

Types of Indexes (B-tree, Bitmap, Clustered, etc.)



 Creating Indexes in Oracle

Using Indexes to Improve Query Performance



 Index Maintenance (Rebuilding, Dropping)

 When Not to Use Indexes

## Why My Query Not Using an Index – 1 class

 Reasons Queries Don’t Use Indexes

Optimizer Hints to Force Index Usage



 Index Selectivity and Cardinality

Using EXPLAIN PLAN to Diagnose Index Usage



 Resolving Common Indexing Issues

## Summarize Data Fast with Materialized Views – 2 classes

Creating Materialized Views



 Refreshing Materialized Views

 Materialized View Logs

Performance Benefits of Materialized Views



 When to Use Materialized Views

## Joins – 1 class

 Hash Joins

Nested Loops Joins



 Merge Joins

 Join Algorithms and Their Performance

Choosing the Right Join for Performance



## Make Inserts, Updates, and Deletes Faster – 2 classes

Optimizing INSERT Performance



 Batch Processing for Bulk Inserts

Optimizing UPDATE and DELETE Queries



 Using Direct Path Inserts

Avoiding Locking Issues during DML Operations



## Find Slow SQL – 2 classes

 Identifying Slow SQL Queries

Using AWR and ASH Reports for Performance Tuning



 SQL Trace and TKPROF

Using Oracle Enterprise Manager (OEM) to Find Slow SQL



Optimizing Slow Queries



## Further Reading – 1 class

Books and Resources for SQL and PL/SQL Tuning



 Oracle Documentation for Advanced Features

 Best Practices for SQL Performance

 Websites and Communities for Oracle Performance Tuning

✅ **Course Fee**

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| --- | --- | --- |
| **Course Name** | **Topics Covered** | **Fee** |
| SQL only | Basic SQL, Advanced SQL – **30 classes** | **₹ 20,000** |
| SQL + PLSQL | Basic SQL, Advanced SQL, PL/SQL - **64 classes** | **₹ 35,000** |
| SQL + PLSQL + Performance Tuning | Basic SQL, Advanced SQL, PL/SQL, Performance Tuning - **80 classes** | ₹ 40,000 |

✅ **Included**

One-to-One Sessions



 Live Session Recording

 Project-Specific Assignments

 GitHub Training Material Access