

## Oracle Database: SQL and PL/SQL Fundamentals

**Duration:** 5 Days

### What you will learn

This Oracle Database: SQL and PL/SQL Fundamentals training delivers the fundamentals of SQL and PL/SQL along with the benefits of the programming languages using Oracle Database technology. You'll explore the concepts of relational databases.

### Learn To:

Write queries against single and multiple tables, manipulate data in tables and create database objects.

Use single row functions to customize output.

Invoke conversion functions and conditional expressions.

Use group functions to report aggregated data.

Create PL/SQL blocks of application code that can be shared by multiple forms, reports and data management applications.

Develop anonymous PL/SQL blocks, stored procedures and functions.

Declare identifiers and trap exceptions.

Use DML statements to manage data.

Use DDL statements to manage database objects.

Declare PL/SQL Variables.

Conditionally control code flow (loops, control structures).

Describe stored procedures and functions.

Retrieve row and column data from tables.

### Benefits to You

Ensure fast, reliable, secure and easy to manage performance. Optimize database workloads, lower IT costs and deliver a higher quality of service by enabling consolidation onto database clouds.

### Hands-On Practices

Demonstrations and hands-on practice reinforce the fundamental concepts that you'll learn in this course. By enrolling in this course, you'll begin using Oracle SQL Developer to develop these program units. SQL\*Plus and JDeveloper are available as optional tools.

### Course Bundle

Note: This course is a combination of Oracle Database: SQL Workshop I and Oracle Database: PL/SQL Fundamentals courses.

### Audience

Application Developers

Forms Developer  
Functional Implementer  
PL/SQL Developer  
Portal Developer  
Reports Developer  
Technical Consultant

## **Related Training**

### *Required Prerequisites*

Familiarity with data processing concepts and techniques

Familiarity with programming concepts

## **Course Objectives**

Run data manipulation statements (DML) to update data in the Oracle Database.

Design PL/SQL anonymous block that execute efficiently.

Describe the features and syntax of PL/SQL.

Handle runtime errors.

Describe stored procedures and functions.

Use PL/SQL programming constructs and conditionally control code flow (loops, control structures, and explicit cursors).

Use cursors to process rows.

Identify the major structural components of the Oracle Database 11g.

Retrieve row and column data from tables with the SELECT statement.

Create reports of sorted and restricted data.

Employ SQL functions to generate and retrieve customized data.

Display data from multiple tables using the ANSI SQL 99 JOIN syntax.

Create reports of aggregated data.

Run data definition language (DDL) statements to create and manage schema objects.

## **Course Topics**

### **Introduction**

Overview of Oracle Database 12c and related products

Overview of relational database management concepts and terminologies  
Introduction to SQL and its development environments  
The HR schema and the tables used in this course  
Oracle Database documentation and additional resources

### **Retrieve Data using the SQL SELECT Statement**

List the capabilities of SQL SELECT statements  
Generate a report of data from the output of a basic SELECT statement  
Use arithmetic expressions and NULL values in the SELECT statement  
Invoke Column aliases  
Concatenation operator, literal character strings, alternative quote operator, and the DISTINCT keyword  
Display the table structure using the DESCRIBE command

### **Restricted and Sorted Data**

Write queries with a WHERE clause to limit the output retrieved  
Describe the comparison operators and logical operators  
Describe the rules of precedence for comparison and logical operators  
Usage of character string literals in the WHERE clause  
Write queries with an ORDER BY clause  
Sort the output in descending and ascending order  
Substitution Variables

### **Usage of Single-Row Functions to Customize Output**

List the differences between single row and multiple row functions  
Manipulate strings using character functions  
Manipulate numbers with the ROUND, TRUNC, and MOD functions  
Perform arithmetic with date data  
Manipulate dates with the DATE functions

### **Conversion Functions and Conditional Expressions**

Describe implicit and explicit data type conversion  
Describe the TO\_CHAR, TO\_NUMBER, and TO\_DATE conversion functions  
Nesting multiple functions  
Apply the NVL, NULLIF, and COALESCE functions to data  
Usage of conditional IF THEN ELSE logic in a SELECT statement

### **Aggregated Data Using the Group Functions**

Usage of the aggregation functions in SELECT statements to produce meaningful reports  
Describe the AVG, SUM, MIN, and MAX function  
How to handle Null Values in a group function?  
Divide the data in groups by using the GROUP BY clause  
Exclude groups of data by using the HAVING clause

### **Display Data From Multiple Tables**

Write SELECT statements to access data from more than one table  
Join Tables Using SQL:1999 Syntax  
View data that does not meet a join condition by using outer joins  
Join a table to itself by using a self join  
Create Cross Joins

### **Usage of Subqueries to Solve Queries**

Use a Subquery to Solve a Problem

Single-Row Subqueries

Group Functions in a Subquery

Multiple-Row Subqueries

Use the ANY and ALL Operator in Multiple-Row Subqueries

Use the EXISTS Operator

## **SET Operators**

Describe the SET operators

Use a SET operator to combine multiple queries into a single query

Describe the UNION, UNION ALL, INTERSECT, and MINUS Operators

Use the ORDER BY Clause in Set Operations

## **Data Manipulation**

Add New Rows to a Table

Change the Data in a Table

Use the DELETE and TRUNCATE Statements

How to save and discard changes with the COMMIT and ROLLBACK statements

Implement Read Consistency

Describe the FOR UPDATE Clause

## **DDL Statements to Create and Manage Tables**

Categorize Database Objects

Create Tables

Describe the data types

Understand Constraints

Create a table using a subquery

How to alter a table?

How to drop a table?

## **Other Schema Objects**

Create, modify, and retrieve data from a view

Perform Data manipulation language (DML) operations on a view

How to drop a view?

Create, use, and modify a sequence

Create and drop indexes

Create and drop synonyms

## **Introduction to PL/SQL**

PL/SQL Overview

List the benefits of PL/SQL Subprograms

Overview of the Types of PL/SQL blocks

Create a Simple Anonymous Block

Generate the Output from a PL/SQL Block

## **PL/SQL Identifiers**

List the different Types of Identifiers in a PL/SQL subprogram

Usage of the Declarative Section to Define Identifiers

Use of variables to store data

Scalar Data Types

%TYPE Attribute

Bind Variables

Sequences in PL/SQL Expressions

## **Write Executable Statements**

Basic PL/SQL Block Syntax Guidelines

How to comment code?

SQL Functions in PL/SQL

Data Type Conversion

Nested Blocks

Operators in PL/SQL

## **Interaction with the Oracle Server**

SELECT Statements in PL/SQL to Retrieve data

Data Manipulation in the Server Using PL/SQL

The SQL Cursor concept

Learn to use SQL Cursor Attributes to Obtain Feedback on DML

How to save and discard transactions?

## **Control Structures**

Conditional processing Using IF Statements

Conditional processing Using CASE Statements

Simple Loop Statement

While Loop Statement

For Loop Statement

The Continue Statement

## **Usage of Composite Data Types**

PL/SQL Records

The %ROWTYPE Attribute

Insert and Update with PL/SQL Records

Associative Arrays (INDEX BY Tables)

INDEX BY Table Methods

INDEX BY Table of Records

## **Explicit Cursors**

Understand Explicit Cursors

Declare the Cursor

How to open the Cursor?

Fetching data from the Cursor

How to close the Cursor?

Cursor FOR loop

Explicit Cursor Attributes

FOR UPDATE Clause and WHERE CURRENT Clause

## **Exception Handling**

What are Exceptions?

Handle Exceptions with PL/SQL

Trap Predefined Oracle Server Errors

Trap Non-Predefined Oracle Server Errors

Trap User-Defined Exceptions

Propagate Exceptions

RAISE\_APPLICATION\_ERROR Procedure

## **Stored Procedures and Functions**

What are Stored Procedures and Functions?

Differentiate between anonymous blocks and subprograms

Create a Simple Procedure

Create a Simple Procedure with IN parameter

Create a Simple Function

Execute a Simple Procedure

Execute a Simple Function