# Oracle Database: SQL and PL/SQL Fundamentals NEW

**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

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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

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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 date 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

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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

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**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?

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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

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