

## Oracle Database 10g: Introduction to SQL

**Duration:** 5 Days

### What you will learn

This course offers students an introduction to Oracle Database 10g database technology. In this class students learn the concepts of relational databases and the powerful SQL programming language. This course provides the essential SQL skills that allow developers to write queries against single and multiple tables, manipulate data in tables, create database objects, and query meta data.

In addition, the advanced features of SQL in order to query and manipulate data within the database are taught. Advanced querying and reporting techniques are explained. Schema objects that are useful for data warehousing and other application areas are discussed in detail. Students learn about manipulating large data sets and storing and retrieving dates according to different time zones.

Learn to:

- Use SQL Statements to retrieve data from tables
- Create and manage tables, and other schema objects
- Employ SQL functions to generate and retrieve customized data
- Control privileges at the object and system level
- Run data manipulation statements (DML) to update data in the Oracle Database 10g
- Search data using Advanced Sub queries, and retrieve hierarchical data

### Audience

- Application Developers
- Business Intelligence Developer
- Database Administrators
- End Users
- Forms Developer
- PL/SQL Developer
- Portal Developer

### Prerequisites

- Suggested Prerequisites*
- Familiarity with Data Processing Concepts and Techniques
- Ability to use a graphical user interface (GUI)

### Course Objectives

- Retrieve row and column data from tables with the SELECT statement.
- Employ SQL functions to generate and retrieve customized data.
- Run data manipulation statements (DML) to update data in the Oracle Database 10g.
- Control user access and manage schema objects

Search data using advanced sub queries

## Course Topics

### Introduction

List the Oracle Database 10g Main Features

An Overview of: components, internet platform, apps server and developer suite

Describe Relational and Object Relational Database Designs

Review the System Development Life Cycle

Define the term Data Models

Describe different means of Sorting Data

Show how Multiple Tables can be related

Describe how SQL Communicates to the Database

### Writing SQL SELECT Statements

Define projection, selection, and join terminology

Review the basic SQL SELECT statement syntax

Select all columns using a wildcard notation from a table

State simple rules and guidelines for writing SQL statements

Write a query containing the arithmetic operators

Create a character expression with the concatenation operator

Using the iSQL\*Plus Environment

SQL statements versus iSQL\*Plus commands

### Restricting and Sorting Data

Limit rows using a selection

Using the WHERE clause to retrieve specific rows

Using the comparison conditions in the WHERE clause

Use the LIKE condition to compare literal values

List the logical conditions AND, OR, NOT

Describe the rules of precedence for the conditions

Sort rows with the ORDER BY clause

Use ampersand substitution in iSQL\*Plus to restrict and sort output at run time

### Using Single-Row Functions to Customize Output

Show the differences between single row and multiple row SQL functions

Categorize the character functions into case manipulation and character manipulation types

Use the character manipulation functions in the SELECT and WHERE clauses

Explain and use the DATE and numeric functions

Use the SYSDATE function to retrieve the current date in the default format

Introduce the DUAL table as a means to view function results

List the rules for applying the arithmetic operators on dates

Use the arithmetic operators with dates in the SELECT clause

### Reporting Aggregated Data Using the Group Functions

Describe and categorize the group functions

Use the group functions

Utilize the DISTINCT keyword with the group functions

Describe how nulls are handled with the group functions

Create groups of data with the GROUP BY clause

Group data by more than one column

Avoid illegal queries with the group functions  
Exclude groups of data with the HAVING clause

### **Displaying Data from Multiple Tables**

Identify Types of Joins

Retrieve Records with Natural Joins

Use Table Aliases to write shorter code and explicitly identify columns from multiple tables

Create a Join with the USING clause to identify specific columns between tables

Use the ON clause to specify arbitrary conditions or specify columns to Join

Create a Three-way join with the ON clause to retrieve information from 3 tables

List the Types of Outer Joins LEFT, RIGHT, and FULL

Generating a Cartesian Product

### **Using Sub queries to Solve Queries**

List the syntax for sub queries in a SELECT statements WHERE clause

List the guidelines for using sub queries

Describe the types of sub queries

Execute single row sub queries and use the group functions in a sub query

Identify illegal statements with sub queries

Execute multiple row sub queries

Analyze how the ANY and ALL operators work in multiple row sub queries

### **Using the SET Operators**

Use the UNION operator to return all rows from multiple tables and eliminate any duplicate rows

Use the UNION ALL operator to return all rows from multiple tables

Describe the INTERSECT operator

Use the INTERSECT operator

Explain the MINUS operator

Use the MINUS operator

List the SET operator guidelines

Order results when using the UNION operator

### **Manipulating Data**

Write INSERT statements to add rows to a table

Copy rows from another table

Create UPDATE statements to change data in a table

Generate DELETE statements to remove rows from a table

Use a script to manipulate data

Save and discard changes to a table through transaction processing

Show how read consistency works

Describe the TRUNCATE statement

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

List the main database objects and describe the naming rules for database objects

Introduce the schema concept

Display the basic syntax for creating a table and show the DEFAULT option

Explain the different types of constraints

Show resulting exceptions when constraints are violated with DML statements

Create a table with a sub query

Describe the ALTER TABLE functionality

Remove a table with the DROP statement and Rename a table

## **Creating Other Schema Objects**

Categorize simple and complex views and compare them

Create a view

Retrieve data from a view

Explain a read-only view

List the rules for performing DML on complex views

Create a sequence

List the basic rules for when to create and not create an index

Create a synonym

## **Managing Objects with Data Dictionary Views**

Describe the structure of each of the dictionary views

List the purpose of each of the dictionary views

Write queries that retrieve information from the dictionary views on the schema objects

Use the COMMENT command to document objects

## **Controlling User Access**

Controlling User Access

System versus Objects Privileges

Using Roles to define user groups

Changing Your Password

Granting Object Privileges

Confirming Privileges Granted

Revoking Object Privileges

Using Database Links

## **Manage Schema Objects**

Using the ALTER TABLE statement

Adding a Column

Modifying a Column

Dropping a Column, Set Column UNUSED

Adding, Enabling and Disabling Constraints

Creating Function-Based Indexes

Performing FLASHBACK operations

External Tables

## **Manipulating Large Data Sets**

Using the MERGE Statement

Performing DML with Sub queries

Performing DML with a RETURNING Clause

Overview of Multi-table INSERT Statements

Tracking Changes in DML

## **Generating Reports by Grouping Related Data**

Overview of GROUP BY Clause

Overview of Having Clause

Aggregating data with ROLLUP and CUBE Operators

Determine subtotal groups using GROUPING Functions

Compute multiple groupings with GROUPING SETS

Define levels of aggregation with Composite Columns

Create combinations with Concatenated Groupings

## **Managing Data in Different Time Zones**

Time Zones

Using date and time functions

Identifying TIMESTAMP Data Types

Differentiating between DATE and TIMESTAMP

Performing Conversion Operations

## **Searching Data Using Advanced Sub queries**

Sub query Overview

Using a Sub query

Comparing several columns using Multiple-Column Sub queries

Defining a Data source Using a Sub query in the FROM Clause

Returning one Value using Scalar Sub query Expressions

Performing ROW by-row processing with Correlated Sub queries

Reusing query blocks using the WITH Clause

## **Hierarchical Retrieval**

Sample Data from the EMPLOYEES Table

The Tree Structure of Employee data

Hierarchical Queries

Ranking Rows with LEVEL

Formatting Hierarchical Reports Using LEVEL and LPAD

Pruning Branches with the WHERE and CONNECT BY clauses

## **Regular Expression Support**

Regular Expression Support Overview

Describing simple and complex patterns for searching and manipulating data