

## 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

*Required 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