

## Oracle Database 11g: Introduction to SQL

**Duration:** 5 Days

### What you will learn

In this course students learn the concepts of relational databases. This course provides the essential SQL skills that allow developers to write queries against single and multiple tables, manipulate data in tables, and create database objects. Students learn to control privileges at the object and system level.

This course covers creating indexes and constraints, and altering existing schema objects. Students also learn how to create and query external tables. Students learn to use the advanced features of SQL in order to query and manipulate data within the database, use the dictionary views to retrieve metadata and create reports about their schema objects. Students also learn some of the date-time functions available in the Oracle Database. This course discusses how to use the regular expression support in SQL.

This course is a combination of Oracle Database 11g: SQL Fundamentals I and Oracle Database 11g: SQL Fundamentals II courses.

In this course, students use Oracle SQL Developer as the main development tool. SQL\*Plus is introduced as an optional development tool.

This course counts towards the Hands-on course requirement for the Oracle Database 11g Administrator Certification. Only instructor-led inclass or instructor-led online formats of this course will meet the Certification Hands-on Requirement. Self Study CD-Rom and Knowledge Center courses DO NOT meet the Hands-on Requirement. This is appropriate for a 10g audience too. There are few minor changes between 10g and 11g features.

Learn To: Create reports of sorted and restricted data  
Run data manipulation statements (DML) to update data  
Control database access to specific objects  
Manage schema objects  
Manage objects with data dictionary views  
Retrieve row and column data from tables

### Audience

Application Developers  
Business Analysts  
Data Warehouse Administrator  
Developer  
Forms Developer  
PL/SQL Developer  
System Analysts

### Prerequisites

#### *Suggested Prerequisites*

Familiarity with data processing concepts and techniques  
Data processing

### Course Objectives

Employ SQL functions to generate and retrieve customized data  
Display data from multiple tables using the ANSI SQL 99 JOIN syntax

Identify the major structural components of the Oracle Database 11g  
Create reports of aggregated data  
Write SELECT statements that include queries  
Retrieve row and column data from tables with the SELECT statement  
Run data manipulation statements (DML) to update data in the Oracle Database 11g  
Create tables to store data  
Utilize views to display and retrieve data  
Control database access to specific objects  
Manage schema objects  
Manage objects with data dictionary views  
Write multiple-column sub-queries  
Use scalar and correlated sub-queries  
Use the regular expression support in SQL  
Create reports of sorted and restricted data

## **Course Topics**

### **Introducing Oracle Database 11g**

List the features of Oracle Database 11g  
Discuss the basic design, theoretical and physical aspects of a relational database  
Categorize the different types of SQL statements  
Describe the data set used by the course  
Log onto the database using the SQL Developer environment  
Save queries to files and use script files in SQL Developer

### **Retrieving 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  
Select All Columns  
Select Specific Columns  
Use Column Heading Defaults  
Use Arithmetic Operators  
Understand Operator Precedence  
Learn the DESCRIBE command to display the table structure

### **Restricting and Sorting Data**

Write queries that contain a WHERE clause to limit the output retrieved  
List the comparison operators and logical operators that are used in a WHERE clause  
Describe the rules of precedence for comparison and logical operators  
Use character string literals in the WHERE clause  
Write queries that contain an ORDER BY clause sort the output of a SELECT statement  
Sort output in descending and ascending order

### **Using Single-Row Functions to Customize Output**

Describe the differences between single row and multiple row functions  
Manipulate strings with character function in the SELECT and WHERE clauses  
Manipulate numbers with the ROUND, TRUNC and MOD functions  
Perform arithmetic with date data  
Manipulate dates with the date functions

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

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

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

Use the aggregation functions in SELECT statements to produce meaningful reports  
Create queries that divide the data in groups by using the GROUP BY clause  
Create queries that exclude groups of data by using the HAVING clause

### **Displaying Data From Multiple Tables**

Write SELECT statements to access data from more than one table  
View data that generally does not meet a join condition by using outer joins  
Join a table by using a self join

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

Describe the types of problem that sub-queries can solve  
Define sub-queries  
List the types of sub-queries  
Write single-row and multiple-row sub-queries

### **Using the SET Operators**

Describe the SET operators  
Use a SET operator to combine multiple queries into a single query  
Control the order of rows returned when using the SET operators

### **Manipulating Data**

Describe each DML statement  
Insert rows into a table with the INSERT statement  
Use the UPDATE statement to change rows in a table  
Delete rows from a table with the DELETE statement  
Save and discard changes with the COMMIT and ROLLBACK statements  
Explain read consistency

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

Categorize the main database objects  
Review the table structure  
List the data types available for columns  
Create a simple table  
Decipher how constraints can be created at table creation  
Describe how schema objects work

### **Creating Other Schema Objects**

Create a simple and complex view  
Retrieve data from views  
Create, maintain, and use sequences  
Create and maintain indexes  
Create private and public synonyms

### **Controlling User Access**

Differentiate system privileges from object privileges

- Grant privileges on tables
- View privileges in the data dictionary
- Grant roles
- Distinguish between privileges and roles

### **Managing Schema Objects**

- Add constraints
- Create indexes
- Create indexes using the CREATE TABLE statement
- Create function-based indexes
- Drop columns and set column UNUSED
- Perform FLASHBACK operations
- Create and use external tables

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

- Explain the data dictionary
- Find table information
- Report on column information
- View constraint information
- Find view information
- Verify sequence information
- Understand synonyms
- Add comments

### **Manipulating Large Data Sets**

- Manipulate data using sub-queries
- Describe the features of multi-table inserts
- Use the different types of multi-table inserts
- Merge rows in a table
- Track the changes to data over a period of time

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

- Use data types similar to DATE that store fractional seconds and track time zones
- Use data types that store the difference between two date-time values
- Practice using the multiple data-time functions for globalize applications

### **Retrieving Data Using Sub-queries**

- Write a multiple-column sub-query
- Use scalar sub-queries in SQL
- Solve problems with correlated sub-queries
- Update and delete rows using correlated sub-queries
- Use the EXISTS and NOT EXISTS operators
- Use the WITH clause

### **Regular Expression Support**

- List the benefits of using regular expressions
- Use regular expressions to search for, match, and replace strings