

## Course Outline

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### Oracle Database: Introduction to SQL NEW

**Duration:** 5 days (30 hours)

#### Learning Objectives:

- Identify the major structural components of the Oracle Database 12c
- Create reports of aggregated data
- Write SELECT statements that include queries
- Retrieve row and column data from tables
- Run data manipulation statements (DML) in Oracle Database 12c
- Create tables to store data
- Utilize views to display data
- Control database access to specific objects
- Manage schema objects
- Display data from multiple tables using the ANSI SQL 99 JOIN syntax
- Manage objects with data dictionary views
- Write multiple-column sub-queries
- Employ SQL functions to retrieve customized data
- Use scalar and correlated sub-queries
- Create reports of sorted and restricted data

#### Target Audience

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

#### Prerequisites:

- Familiarity with data processing concepts and techniques
- Data processing

#### Topics Covered:

- Introduction to Oracle Database
  - List the features of Oracle Database 12c
  - 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 on to the database using SQL Developer environment
  - Save queries to files and use script files in SQL Developer

- 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
  - 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
- Learn to Restrict and Sort 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 to sort the output of a SELECT statement
  - Sort output in descending and ascending order
- Usage of 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
- Invoke 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
- Aggregate Data Using the Group Functions
  - Use the aggregation functions to produce meaningful reports
  - Divide the retrieved data in groups by using the GROUP BY clause
  - Exclude groups of data by using the HAVING clause
- Display Data From Multiple Tables Using Joins
  - 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 to itself by using a self join
- Use 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
- 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
- Data Manipulation Statements
  - Describe each DML statement
  - Insert rows into a table
  - Change rows in a table by the UPDATE statement
  - Delete rows from a table with the DELETE statement
  - Save and discard changes with the COMMIT and ROLLBACK statements
  - Explain read consistency
- Use of 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
- 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
- Control User Access
- Differentiate system privileges from object privileges
  - Create Users
  - Grant System Privileges
  - Create and Grant Privileges to a Role
  - Change Your Password
  - Grant Object Privileges
  - How to pass on privileges?
  - Revoke Object Privileges
- Management of Schema Objects
- Add, Modify, and Drop a Column
  - Add, Drop, and Defer a Constraint
  - How to enable and Disable a Constraint?
  - Create and Remove Indexes
  - Create a Function-Based Index
  - Perform Flashback Operations
  - Create an External Table by Using ORACLE\_LOADER and by Using ORACLE\_DATAPUMP
  - Query External Tables
- Manage Objects with Data Dictionary Views
- Explain the data dictionary
  - Use the Dictionary Views
  - USER\_OBJECTS and ALL\_OBJECTS Views
  - Table and Column Information
  - Query the dictionary views for constraint information
  - Query the dictionary views for view, sequence, index and synonym information
  - Add a comment to a table
  - Query the dictionary views for comment information
- Manipulate Large Data Sets
- Use Subqueries to Manipulate Data
  - Retrieve Data Using a Subquery as Source
  - Insert Using a Subquery as a Target
  - Usage of the WITH CHECK OPTION Keyword on DML Statements
  - List the types of Multitable INSERT Statements
  - Use Multitable INSERT Statements
  - Merge rows in a table
  - Track Changes in Data over a period of time
- Data Management in different Time Zones
- Time Zones
  - CURRENT\_DATE, CURRENT\_TIMESTAMP, and LOCALTIMESTAMP
  - Compare Date and Time in a Session's Time Zone
  - DBTIMEZONE and SESSIONTIMEZONE
  - Difference between DATE and TIMESTAMP
  - INTERVAL Data Types
  - Use EXTRACT, TZ\_OFFSET and FROM\_TZ
  - Invoke TO\_TIMESTAMP, TO\_YMINTERVAL and TO\_DSINTERVAL

- Retrieve Data Using Sub-queries
  - Multiple-Column Subqueries
  - Pairwise and Nonpairwise Comparison
  - Scalar Subquery Expressions
  - Solve problems with Correlated Subqueries
  - Update and Delete Rows Using Correlated Subqueries
  - The EXISTS and NOT EXISTS operators
  - Invoke the WITH clause
  - The Recursive WITH clause
  
- Regular Expression Support
  - Use the Regular Expressions Functions and Conditions in SQL
  - Use Meta Characters with Regular Expressions
  - Perform a Basic Search using the REGEXP\_LIKE function
  - Find patterns using the REGEXP\_INSTR function
  - Extract Substrings using the REGEXP\_SUBSTR function
  - Replace Patterns Using the REGEXP\_REPLACE function
  - Usage of Sub-Expressions with Regular Expression Support
  - Implement the REGEXP\_COUNT function