

## **ITSW 1007**

### **Course Syllabus**

**1. Name of Course:** Introduction to Oracle 11g: SQL

**2. Number of Clock Hours:** 60 hours

#### **3. Course Description:**

This course prepares Oracle database administrators (DBA) to create an operational database and properly manage the various structures in an effective and efficient. The instructor-led lesson topics are reinforced with structured hands-on practices. Prepares students for the Oracle Certified Associate exam.

Prerequisites: General computer knowledge including relational database concepts.

#### **4. Course Objectives**

At the end of this course, students will be able to:

- Control data and user access
- Control transactions
- Create and maintain database objects
- Perform multitable INSERT commands and use external tables
- Retrieve, insert, update, and delete data
- Use GROUPING SETS and the WITH clause
- Use iSQL\*Plus to format reports
- Use the new single-row DATETIME and NVL2 functions introduced in Oracle11g
- Write SQL scripts that use SQL to generate SQL
- Solve problems by using multicolumn subqueries, subqueries in the from clause of a SELECT statement, correlated subqueries, and scalar subqueries
- Describe relational and object relational database concepts
- Use advanced techniques to retrieve data by using ROLLUP, CUBE, set operators, correlated subqueries, and hierarchical queries
- Use basic iSQL\*Plus commands

#### **5. Rationale:**

6 Upon completion of this course, students will have a better understanding of Oracle 11g, a powerful and popular database system.

#### **6. Required Materials:**

Oracle Official Curriculum included.

#### **7. Evaluation**

Those who participate in class discussions, complete course lab work, and miss no more than three class meetings will be awarded 6.0 continuing education units.

#### **8. Course Outline**

##### **Introduction**

- Describing the Life Cycle Development Phases
- Defining a Database
- Discussing the Theoretical, Conceptual, and Physical Aspects of a Relational Database

- Describing How a Relational Database Management System (RDBMS) Is Used to Manage a Relational Database
- Describing the Oracle Implementation of Both the RDBMS and the Object Relational Database Management System (ORDBMS)
- Describing How SQL Is Used in the Oracle Product Set

#### **Writing a Basic SQL Statement**

- Describing the SQL Select Capabilities
- Executing a Basic Select Statement with the Mandatory Clauses
- Differentiating Between SQL and iSQL\*Plus Commands

#### **Restricting and Sorting Data**

- Limiting the Rows Retrieved by a Query
- Sorting the Rows Retrieved by a Query

#### **Single Row Functions**

- Describing Various Types of Functions Available in SQL
- Using a Variety of Character, Number, and Date Functions in SELECT Statements
- Explaining What the Conversion Functions Are and How They Are Used
- Using Control Statements

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

- Writing SELECT Statements to Access Data from More Than One Table
- Describing the Cartesian Product
- Describing and Using the Different Types of Joins
- Writing Joins Using the Tips Provided
- Aggregating Data by Using Group Functions
- Identifying the Different Group Functions Available
- Explaining the Use of Group Functions
- Grouping Data by Using the GROUP BY Clause

#### **Writing Subqueries**

- Describing the Types of Problems That Subqueries Can Solve
- Describing Subqueries
- Listing the Types of Subqueries
- Writing Single-Row and Multi-Row Subqueries
- Describing and Explaining the Behavior of Subqueries When NULL Values Are Retrieved

#### **Producing Readable Output with iSQL\*Plus**

- Producing Queries That Require an Input Variable
- Customizing the iSQL\*Plus Environment
- Producing More Readable Output
- Creating and Executing Script Files

#### **Manipulating Data**

- Describing Each Data Manipulation Language (DML) Command
- Inserting Rows into a Table
- Updating Rows in a Table
- Deleting Rows from a Table
- Merging Rows into a Table
- Controlling Transactions
- Describing Transaction Processing
- Describing Read Consistency and Implicit and Explicit Locking

#### **Creating and Managing Tables**

- Describing the Main Database Objects
- Creating Tables

- Describing the Oracle Data Types
- Altering Table Definitions
- Dropping, Renaming, and Truncating Tables

#### **Including Constraints**

- Describing Constraints
- Creating and Maintaining Constraints

#### **Creating Views**

- Describing Views and Their Uses
- Creating a View
- Retrieving Data by Means of a View
- Inserting, Updating, and Deleting Data Through Views
- Dropping Views
- Altering the Definition of a View
- Inline Views
- Top 'N' Analysis

#### **Other Database Objects**

- Creating, Maintaining, and Using Sequences
- Creating and Maintaining Indexes
- Creating Private and Public Synonyms
- Controlling User Access
- Understanding the Concepts of Users, Roles, and Privileges
- Granting and Revoking Object Privileges
- Creating Roles and Granting Privileges to Roles
- Creating Synonyms for Ease of Table Access

#### **SQL Workshop**

- Applying Techniques Learned in This Course
- Preparing for Future Oracle Courses

#### **Using Set Operators**

- Describing the Set Operators
- Obeying the Set Operators Rules and Guidelines
- Using a Set Operator to Combine Multiple Queries into a Single Subquery
- Controlling the Order of Rows Returned

#### **Oracle11g Single Row Functions**

- Using DATETIME Functions
- Using the NVL2 Function to Handle NULL Values

#### **Enhancements to the GROUP BY Clause**

- Using ROLLUP as an Extension to the GROUP BY Clause to Produce Subtotal Values
- Using CUBE as an Extension to the GROUP BY Clause to Produce Cross-Tabulation Values
- Using the GROUPING Function to Identify the Row Values Created by ROLLUP or CUBE Operators
- Using GROUPING SETS to Produce a Single Result Set That Is Equivalent to a UNION ALL Approach
- Using the WITH Clause

#### **Advanced Subqueries**

- Updating and Deleting Rows by Using Correlated Subqueries
- Writing a Multicolumn Subquery
- Describing and Explaining the Behavior of Subqueries When Null Values Are Retrieved
- Writing a Subquery in a FROM Clause

- Describing the Types of Problems That Can Be Solved with a Correlated Subquery
- Describing a Correlated Subquery
- Writing Correlated Subqueries
- Using the EXISTS and NOT EXISTS Operators

#### **Hierarchical Retrieval**

- Discussing the Benefits of the Hierarchical Query
- Ordering the Rows Retrieved by a Query in a Hierarchical Manner
- Formatting Hierarchical Data so That It Is Easy to Read
- Excluding Branches from the Tree Structure

#### **Extensions to DDL and DML Statements**

- Discussing Multitable Inserts
- Creating and Using External Tables
- Naming the Index and Using the CREATE INDEX Command at the Time of Creating Primary Key Constraint

#### **Writing Scripts to Generate Scripts**

- Describing the Types of Problems That are Solved by Writing SQL Scripts That Generate Other SQL Scripts
- Writing and Executing Scripts that Generate Scripts with Commands to Create and Drop Tables
- Writing and Executing a Script that Generates a Script of INSERT INTO Commands