

ITSE 1078 [formerly ITSE 1045] Course Syllabus

1. Name of Course: Oracle 11g SQL and PL/SQL

2. Number of Clock Hours: 60 hours

3. Course Description:

This course offers students an extensive introduction to data server technology. The class covers the concepts of relational databases and the powerful SQL and PL/SQL programming languages. Students are taught to create and maintain database objects and to store, retrieve, and manipulate data. In addition, students learn to create PL/SQL blocks of application code that can be shared by multiple forms, reports, and data management applications. Demonstrations and hands-on practice reinforce the fundamental concepts. Prerequisites: General computer knowledge including database concepts.

4. Course Objectives

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

- Control data/user access
- Control transactions
- Create and maintain database objects
- Describe the features and syntax of PL/SQL
- Retrieve, insert, update, and delete data
- Handle runtime errors
- Describe relational database concepts
- Conditionally control code flow (loops, control structures, and explicit cursors)
- Use basic SQL*Plus commands

5. Rationale:

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 Lifecycle 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

- Describing PL/SQL
- Describing the Use of PL/SQL for the Developer and the DBA

Writing a Basic SQL Statement

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

Displaying Data from Multiple Tables

- Writing SELECT Statements to Access Data from More Than One Table
- Describing the Cartesian Product
- Describing and Using the Four Different Types of Join
- Writing Joins Using the Tips Provided

Aggregating Data using Group Functions

- Identifying the Different Group Functions Available
- Explaining the Use of Group Functions
- Grouping Data Using the GROUP BY Clause
- Including or Excluding Grouped Rows Using the HAVING Clause

Writing Subqueries

- Describing the Types of Problems That Subqueries Can Solve
- Describing What Subqueries Are
- Listing the Types of Subqueries
- Writing Single-Row and Multi-Row Subqueries

Multi-Column Subqueries

- Writing a Multi-Column Subquery
- Describing and Explaining the Behavior of Subqueries When NULL Values Are Retrieved
- Writing a Subquery in a FROM Clause

Producing Readable Output with SQL*Plus

- Producing Queries that Require an Input Variable
- Customising the SQL*Plus Environment
- Producing More Readable Output
- Creating and Executing Script Files
- Saving Customisations

Manipulating Data

- Describing Each Data Manipulation Language (DML) Command
- Inserting Rows into a Table
- Updating Rows in a Table
- Deleting Rows from a Table
- Controlling Transactions
- Describing Transaction Processing

Creating and Managing Tables

- Describing the Main Database Objects
- Creating Tables
- Describing the Oracle7 Data types and the Oracle8 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 Via 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

Declaring Variables

- Recognizing the Basic PL/SQL Block and Its Sections
- Describing the Significance of Variables in PL/SQL
- Distinguishing Between PL/SQL and Non-PL/SQL Variables
- Declaring Variables and Constants
- Executing a PL/SQL Block

Writing Executable Statements

- Recognizing the Significance of the Executable Section
- Writing Statements Within the Executable Section
- Describing the Rules of Nested Blocks
- Executing and Testing a PL/SQL Block
- Using Coding Conventions

Interacting with the Oracle Server

- Writing a Successful SELECT Statement in PL/SQL
- Declaring the Data type and Size of a PL/SQL Variable Dynamically
- Writing DML Statements in PL/SQL
- Controlling Transactions in PL/SQL
- Determining the Outcome of SQL DML Statements

Writing Control Structures

- Identifying the Uses and Types of Control Structures
- Constructing an IF Statement
- Constructing and Identifying Different Loop Statements
- Controlling Block Flow Using Nested Loops and Labels
- Using Logic Tables.