

**Course Description:** course is designed to give users an understanding of Oracle SQL and Oracle PL/SQL languages using Oracle's SQL\*Plus and iSQL\*Plus tools. The course covers SQL commands for DML, DDL, Query, and Transaction Control operations. Students are also introduced to procedural programming using PL/SQL. The course topics are applicable to all versions of Oracle through Oracle 10g.

**Who Should Attend:** Application designers and developers, database administrators and operators, and end users should attend this course.

**Prerequisites:** There are not prerequisites for this course.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Explain the difference between SQL, PL/SQL and SQL\*PLUS.
- Write basic SQL queries to retrieve desired data.
- Use DML statements (insert, update, and delete).
- Use DDL statements (create, alter, and drop).
- Use transaction control statements to commit, rollback, and create savepoints.
- Write advanced queries.
- Write scripts to do queries and display SQL\*PLUS reports.
- Control access to your database objects.
- Write a PL/SQL block using all elements of block structure.
- Write PL/SQL statements using lexical units, declared variables, and assignment statements.
- Use control structures to loop, branch, and jump.
- Use PL/SQL named exceptions and user-defined exceptions.
- Use explicit cursors.

### Course Outline:

#### Database Design

Database Models  
Beginnings  
Some Introductory Terminology  
Codd's 12 Rules  
Normalization  
First Normal Form  
Higher Order Normal Forms

#### Oracle Standard Interfaces

SQL  
SQL\*Plus  
Oracle Architecture  
Interfaces to Oracle  
Command Line Interface  
Viewing a Sample Table  
The Graphical User Interface  
The SQL Buffer  
The Web-Based Interface  
Describe

#### The Sample Database

The Entity Relationship Model  
Entity Relationship Diagrams  
The Sample Database  
ER Diagram for Sample Database  
Creating the Sample Data  
Viewing Sample Data  
Data Types of the Sample Data

#### Data Definition Language

Categories of SQL Statements  
Oracle Datatypes  
The CREATE Statement  
The DROP Command  
The ALTER Command  
Integrity Constraints  
Entity Integrity Constraints  
Referential Integrity Constraints  
Modifying Table to Use Constraints  
Checking Constraints  
The Data Dictionary

#### Data Manipulation Language

DML Statements  
The SELECT Statement  
The INSERT Statement  
The DELETE Statement  
The UPDATE Statement

More SQL\*Plus Commands

#### Transaction Control

Transactions  
Command Classification  
Savepoints  
The SET TRANSACTION Command

#### SQL Operators

Simple Selects  
Comparison Operators  
IN and NOT IN Operators  
BETWEEN Operator  
The LIKE Operator  
Logical Operators  
IS NULL and IS NOT NULL  
ANY  
ALL

#### SQL FUNCTIONS

Introduction  
The DISTINCT Keyword  
Aliases  
Miscellaneous Functions  
Mathematical Functions  
String Functions  
Date Functions  
Conversion Functions  
Pseudo Columns

#### Joining Tables

Joins  
Cartesian Product  
Inner Joins  
Equi-Join  
Table Aliases  
Non-Equi Join  
Non-Key Join  
Reflexive Join  
Natural Join  
Outer Joins  
Right Outer Join  
Left Outer Join  
Full Outer Join  
Oracle-Specific Syntax for Outer Joins

#### Set Operators

Introduction  
Selection Criteria  
Union

Union All  
Intersect  
Minus

#### SQL Subqueries

Introduction  
Using a Subquery with a DML Statement  
Typical Subqueries  
Subquery Operators  
Standard vs. Correlated Subqueries  
Correlated Subquery Example  
Predicate Operators

#### Groups

SQL Statements  
GROUP BY Clause  
HAVING Clause  
Order of a SELECT Statement

#### More Database Objects

More Database Objects  
Relational Views  
Updating a View  
Create or Replace  
Forcing a View  
The Data Dictionary Revisited  
Indexes  
Synonyms

#### Reports

Report Features  
Session Control  
The SET Command  
The COLUMN Command  
The BREAK Command  
The COMPUTE Command

#### Introduction

SQL vs. PL/SQL  
A Few Simple Examples  
Saving Procedures  
A More Complete Picture  
Comments  
Variable Substitution  
Simple Exception Handling  
Advantages of PL/SQL  
Assignments

#### Declarations and Data Types

Declarations  
Standard Data Types  
Initialization  
Variable Names  
Specialized Data Types - %TYPE  
Specialized Data Types - %ROWTYPE  
Building Your Own Data Types - Records  
A Quick look at Loops  
Arrays  
Tables  
Nested Blocks

#### Language Components

Introduction  
Assignments  
Decision Making Statements  
Simple Loops  
Loops - for  
Loops - indefinite  
Loops - while  
Simple Loops  
Nested Loops  
Boolean Variables  
PL/SQL Relational Operators  
PL/SQL Logical Operators  
The CASE Construct

#### Cursors

Introduction  
Cursor Manipulation  
Using the Cursor  
For Loops Cursors  
Cursor Attributes  
Cursor Parameters  
Nested Cursors  
Cursor Exceptions

#### Exceptions

Errors in Programs  
Run Time Exceptions  
Oracle Built In Exceptions  
Unnamed Exceptions  
Built in Exception Functions  
Creating Your Own Exceptions  
Building Non Terminating Exceptions

#### Functions and Procedures

Introduction

Creating a Procedure  
Example Procedure  
Using Parameters  
Functions  
Procedures and Exceptions

#### Appendix A: An SQL and SQL\*Plus Reference

DDL Statements  
DML Statements  
Transaction Control Statements  
Operators  
Common SQL\*Plus Commands