

# ORACLE 11g PL/SQL Programming

**Course Length:** 3 days      **Course Cost:** €1,000

**Course Description:** A Relational Database Management System (RDBMS) is a software system that allows you to create and manage a relational database. Minimum requirements for such a system are defined by both ANSI and [ISO. PL/SQL](#) is Oracle’s Procedural Language for SQL. It is Oracle’s database programming language for creating stored procedures, functions, database triggers, and object methods. PL/SQL can be used for implementing business rules, computing algorithms, manipulating data, and for stand-alone programs. The Oracle® 11g release has greatly enhanced the features and functionality of PL/SQL. Students will write stored procedures, functions, packages, and triggers, and implement complex business rules in Oracle. Students will learn programming, management, and security issues of working with PL/SQL program units. Programming topics will include the built-in packages that come with Oracle, the creation of triggers, and stored

**Audience:** Application developers and database administrators

**Prerequisites:** A good working knowledge of Oracle 11g SQL features is required. Programming experience in a high-level language, such as COBOL™, Java™, or Perl is also required

## Course Contents

<p><b>Triggers</b></p> <ul style="list-style-type: none"> <li>• Beyond Declarative Integrity</li> <li>• Triggers</li> <li>• Types of Triggers Trigger Sequencing Row-Level Triggers Trigger Predicates Trigger Conditions Using Sequences</li> <li>• Cascading Triggers and Mutating Tables Generating an Error</li> <li>• Maintaining Triggers</li> </ul> <p><b>PL/SQL Variables and Datatypes</b></p> <ul style="list-style-type: none"> <li>• Anonymous Blocks Declaring Variables Datatypes</li> <li>• Subtypes</li> <li>• Character Data</li> <li>• Dates and Timestamps Date Intervals</li> <li>• Anchored Types</li> <li>• Assignment and Conversions</li> <li>• Selecting into a Variable Returning into a Variable</li> </ul>	<p><b>Records, Collections, and User- Defined Types</b></p> <ul style="list-style-type: none"> <li>• Record Variables</li> <li>• Using the %ROWTYPE Attribute User-Defined Object Types</li> <li>• VARRAY and Nested TABLE</li> <li>• Collections</li> <li>• Using Nested TABLES</li> <li>• Using VARRAYS</li> <li>• Collections in Database Tables Associative Array Collections Collection Methods</li> <li>• Iterating Through Collections</li> </ul> <p><b>Cursors</b></p> <ul style="list-style-type: none"> <li>• Multi-Row Queries</li> <li>• Declaring and Opening Cursors Fetching Rows</li> <li>• Closing Cursors</li> <li>• The Cursor FOR Loop</li> <li>• FOR UPDATE Cursors</li> <li>• Cursor Parameters</li> </ul>
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**PL/SQL Syntax and Logic**

- Conditional Statements –
- IF/THEN
- Conditional Statements – CASE
- Comments and Labels
- Loops
- WHILE and FOR Loops
- SQL in PL/SQL
- Local Procedures and Functions

**Stored Procedures and Functions**

- Stored Subprograms
- Creating a Stored Procedure
- Procedure Calls and Parameters
- Parameter Modes
- Named Parameter Notation Default Arguments
- Creating a Stored Function
- Stored Functions and SQL
- Invoker’s Rights

**Exception Handling**

- SQLCODE and SQLERRM Exception Handlers
- Nesting Blocks
- Scope and Name Resolution
- Declaring and Raising Named Exceptions
- User-Defined Exceptions

**Records, Collections, and User- Defined Types**

- Record Variables
- Using the %ROWTYPE Attribute
- User-Defined Object Types
- VARRAY and Nested TABLE
- Collections
- Using Nested TABLEs
- Using VARRAYs
- Collections in Database Tables
- Associative Array Collections
- Collection Methods
- Iterating Through Collections
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- The Implicit (SQL) Cursor

**Bulk Operations**

- Bulk Binding
- BULK COLLECT Clause
- FORALL Statement
- FORALL Variations
- Bulk Returns
- Bulk Fetching with Cursors

**Using Packages**

- Packages
- Oracle-Supplied Packages
- The DBMS\_OUTPUT Package
- The DBMS\_UTILITY Package
- The UTL\_FILE Package
- Creating Pipes with DBMS\_PIPE
- Writing to and Reading from a Pipe
- The DBMS\_METADATA Package
- XML Packages
- Networking Packages
- Other Supplied Packages

**Creating Packages**

- The Package Interface and Implementation
- Package Variables and Package State
- Overloading Package Functions and Procedures
- Forward Declarations
- Strong REF CURSOR Variables
- Weak REF CURSOR Variables

**Working with LOBs**

- Large Object Types
- Oracle Directories
- LOB Locators
- Internal LOBs
- LOB Storage and
- SECUREFILES
- External LOBs
- Temporary LOBs
- The DBMS\_LOB Package

**Maintaining PL/SQL Code**

- Privileges for Stored Programs
- Data Dictionary
- PL/SQL Stored Program Compilation

	<ul style="list-style-type: none"><li>• Conditional Compilation Compile-Time Warnings The PL/SQL Execution Environment Dependencies and Validation Maintaining Stored</li></ul>
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