



ANTELOPE VALLEY COLLEGE  
Academic Affairs  
Course Outline of Record

Academic Affairs Only

<input type="checkbox"/>	New Course
<input type="checkbox"/>	Effective Date (for articulation)
<input checked="" type="checkbox"/>	COR Revision 12/10/2009
<input type="checkbox"/>	Pre Req/Advisories
<input type="checkbox"/>	Other Changes
<input checked="" type="checkbox"/>	SLOs 4/10/2008

**COURSE SUBJECT & NUMBER:** CA 133

**COURSE NAME:** \*Oracle PL/SQL Programming

**COURSE UNITS:** 3.0 **COURSE HOURS:** 4 hours weekly

**COURSE REQUISITES:** (Follow format of similar courses found in the college catalog.)

**Prerequisite:** Completion of CA 132

**Advisory:** Eligibility for ENGL 099, READ 099, and MATH 102

**COURSE DESCRIPTION:** (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R#). Students will develop their Oracle Relational Database Structured Query Language (SQL) skills into writing Oracle Stored Procedures using Programming Language SQL (PL/SQL) in a client/server environment. In both lecture and lab, students will learn PL/SQL Database Programming by using the Oracle SQL\*Plus tool and a simple text editor. Proper structured programming design and formatting will be taught using flow diagrams and sample code. Students will refresh their knowledge of SQL Data Manipulation Language (DML) and Data Definition Language (DDL). Students will also learn how database security issues, such as database users, roles and grants, apply to the execution of PL/SQL code. This course helps prepare students for the PL/SQL portion of Oracle's Exam # SQL Exam (1Z0-007). **BEFORE ENROLLING** students should have used SQL to extract database records, create a table, enter, edit and delete records, sort, and group records. Students should understand how to save and retrieve files from local and network drives. (CSU, AVC)

**COURSE OBJECTIVES:** (Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)

Upon completion of course, the successful student will be able to:

1. Apply Structured Programming Concepts.
2. Describe the nature of a Computer Program.
3. Model Good Programming Practices.
4. Apply Basic PL/SQL Concepts.
5. Use PL/SQL in a Client-Server Architecture.
6. Use PL/SQL in the SQL\*Plus tool.
7. Explain General Programming Language Fundamentals.
8. Practice PL/SQL programming Fundamentals.
9. Use Data Manipulation Language (DML) in PL/SQL.
10. Demonstrate the use of a Save-point in PL/SQL.
11. Design Conditional Program Control using: IF Statements, ELSIF Statements, and Nested IF Statements.
12. Apply Exception Handling using Built-In-Exceptions.
13. Respond to Errors and Built-In-Exceptions.
14. Apply Structured Programming Iterative Control using: Simple Loops, WHILE Loops, Numeric FOR Loops, and Nested Loops.
15. Introduce Database Cursors, as a Special Type of Array, into their PL/SQL Programs.
16. Manipulate Cursors in a PL/SQL Program using Cursor FOR Loops and Nested Cursors.
17. Use PARAMETERS with Cursors.
18. Apply Programmatic Exceptions as error handlers.
19. Use Exception Scope, USER-DEFINED Exceptions, and Exception Propagation in PL/SQL programs.
20. Apply RAISE\_APPLICATION\_ERROR, EXCEPTION\_INITPRAGMA, SQLCODE and SQLERRM.
21. Create PL/SQL Procedures that pass Parameters IN and OUT of the Procedure.
22. Create and use PL/SQL Functions in the PL/SQL programs.
23. Appraise the Benefits of Utilizing PL/SQL Packages.
24. Use PL/SQL to write database Triggers.
25. Explain what Triggers are, the types of Triggers and how Triggers are used with Mutation Table issues.
26. Demonstrate the use of PL/SQL Tables.

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**COURSE CONTENT:** *(Enter course content in terms of specific topics or a specific body of knowledge that each instructor must cover. Put topics in outline form with major and minor headings. Each instructor must cover all material listed below.)*

- I. Programming Concepts
  - A. The Nature of a Computer Program.
  - B. Good Programming Practices.
- II. PL/SQL Concepts and Language Fundamentals
  - A. PL/SQL in Client-Server Architecture. PL/SQL in SQL\*Plus.
  - B. PL/SQL Programming Fundamentals
  - C. Making use of SQL - DML in PL/SQL
  - D. Making use of Save-point
- III. PL/SQL Programmatic Conditional Control
  - A. IF Statements. ELSIF Statements. Nested IF Statements
  - B. Interactive Control
    - 1. Simple Loops
    - 2. WHILE Loops
    - 3. Numeric FOR Loops
    - 4. Nested Loops
- IV. Introduction to Cursors
  - A. Cursor Manipulation
  - B. Using Cursor FOR Loops and Nesting Cursors
  - C. Using PARAMETERS with Cursors
- V. Exceptions
  - A. Handling Errors with Exception Handling and Built-in Exceptions
  - B. Exception Scope. USER\_DEFINED Exceptions.
  - C. Exception Propagation
- VI. Exceptions: Advanced Concepts
  - A. RAISE\_APPLICATION\_ERROR
  - B. EXCEPTION INIT PRAGMA
  - C. SLCODE and SQLERRM
- VII. PL/SQL Procedures & Functions
  - A. Creating Procedures
  - B. Passing Parameters IN and OUT of Procedures
  - C. Creating and Using Functions
- VIII. PL/SQL Packages
  - A. The Benefits of Utilizing Packages
  - B. Writing PL/SQL Packages
- IX. Stored Code
  - A. Advanced Features of Stored Code
  - B. Using Stored Code in PL/SQL
- X. Triggers
  - A. Triggers Defined
  - B. Types of Triggers
  - C. Mutating Table Issues
- XI. PL/SQL Tables
  - A. Making Use of PL/SQL Tables
  - B. Making use of PL/SQL Cursors

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**TYPICAL HOMEWORK ASSIGNMENTS:** (Do not include in-class work, quizzes, or tests)

*This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.*

**1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:**

Each week students will be required to read 15 to 25 pages from the assigned textbook. Evaluation of student knowledge gained from the reading will be done using both class discussion time and the on-line web-quizzes provided by the textbook publisher.

**2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:**

Answer assigned weekly textbook problems and exercises by answering questions and by writing syntactically correct PL/SQL database programs. Each lesson culminates in one or more programming assignments.

**3. Describe nature and frequency of typical computational assignments if applicable; note if any are required:**

Students will use mathematical functions to make calculations on data returned by database queries to generate derived data from table entries.

**4. Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:**

Analyze requests for information and turn these into syntactically correct PL/SQL database code.

Apply the rules for PL/SQL program design to the problems of data manipulation and data definition.

Design and code Oracle database stored procedures, functions and packages.

Evaluate Oracle PL/SQL code for data manipulation and control.

*For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work *times* each unit of credit *minus* classroom hours *equals* required homework hours.*

**Reading Assignments:** 3

**Computational Assignments:** 1

**Writing Assignments:** 2

**Other Assignments:** 3 (writing PL/SQL programs)

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**METHODS OF INSTRUCTION:** *(Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)*

Lectures, demonstrations by the instructor, and student lab participation using the text (Oracle PL/SQL Interactive Workbook) along with other instructional materials supplied by the instructor in class and online.

**METHODS OF EVALUATION:** *(These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)*

Instructor will evaluate the following: Student's completion of assigned chapter questions and website assignments.

- Results of quizzes and examinations that are based upon the textbook, online & lecture materials. (Objectives 2, 7)
- Student's completion of computer and lab assignments. . (Objectives 1, 3-6, and 8-26)
- Student's completion of short writing assignments. (Objectives 2, 7)
- Classroom participation in discussion of textbook and lecture material. (Objectives 2, 7)
- Evaluation of student knowledge gained from the reading will be done using both class discussion time and the on-line web-quizzes provided by the textbook publisher. (Objectives 2, 7)
- Evaluation of students adherence to programming practices (Objectives 1, 2, 3, 12, 13 & 14)

#### **Suggested Texts or Other Instructional Materials**

*(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)*

Primary Course Text: Oracle PL/SQL Interactive Workbook, 2<sup>nd</sup> Edition (with provided interactive training web site) by Benjamin Rosenzweig and Elena Siverstrova, published by Prentice Hall in 2003, ISBN: 10: 0-13-047320-0

The 2<sup>nd</sup> edition of book is still being sold and the course Web site is still active. This is the best text for a lab class because of the comprehensive scope of the programming assignments.