CENTENNIAL COLLEGE

Course Outline

School:	Eng. Tech. & Applied Science
Department:	Information and Communication Engineering Technology (ICET)
Course Title:	Advanced Database Concepts
Course Code:	COMP 214
Course Hours/Credits:	56
Prerequisites:	COMP 122
Co-requisites:	N/A
Eligible for Prior Learning, Assessment and Recognition:	Yes
Originated by:	John Bailey
Creation Date:	Fall 2008
Revised by:	Ilia Nika, Bim Harlal
Revision Date:	Fall 2011
Current Semester:	Fall 2016
Approved by:	ppesikan c/o

Chairperson/Dean

Students are expected to review and understand all areas of the course outline.

Retain this course outline for future transfer credit applications. A fee may be charged for additional copies.

This course outline is available in alternative formats upon request.

Course Description

This course is intended to expand student's knowledge of business database systems. The course starts with introducing students to the steps required to install a database server and development system. Then, it expands on the students' knowledge of SQL by introducing more complex syntax than that covered in the first database course. Topics covered include SQL functions, database objects and views, advanced queries, advanced data and table manipulation commands, basic security, triggers, functions, procedures, and packages. The course will include a project to develop the database backend for a "commercial" web application.

Program Outcomes

Successful completion of this and other courses in the program culminates in the achievement of the Vocational Learning Outcomes (program outcomes) set by the Ministry of Training, Colleges and Universities in the Program Standard. The VLOs express the learning a student must reliably demonstrate before graduation. To ensure a meaningful learning experience and to better understand how this course and program prepare graduates for success, students are encouraged to review the Program Standard by visiting http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/. For apprenticeship-based programs, visit http://www.collegeoftrades.ca/training-standards.

Course Learning Outcomes

The student will reliably demonstrate the ability to:

1. Install database software and developer system.
2. Write SQL commands to:
   a. Manipulate character strings, numbers, and dates.
   b. To convert and transform data types.
   c. Create views, indices and sequences.
   d. Perform inner, outer, left or right joins.
   e. Perform subqueries to answer business problems.
3. Write SQL commands to perform advanced data and table manipulation in the context of a prescribed business problem.
4. Explain the basic concepts of security and the responsibilities of a database administrator.
5. Write PL/SQL procedures, triggers, functions, and packages to access and manipulate data.
6. Create the back-end to a software application using, functions, procedures, packages and triggers.

Essential Employability Skills (EES)

The student will reliably demonstrate the ability to*:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
3. Execute mathematical operations accurately.
4. Apply a systematic approach to solve problems.
5. Use a variety of thinking skills to anticipate and solve problems.
6. Locate, select, organize, and document information using appropriate technology and information systems.

7. Analyze, evaluate, and apply relevant information from a variety of sources.
8. Show respect for diverse opinions, values belief systems, and contributions of others.
9. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
10. Manage the use of time and other resources to complete projects.
11. Take responsibility for one's own actions, decisions, and consequences.

**There are 11 Essential Employability Skills outcomes as per the Ministry Program Standard. Of these 11 outcomes, the following will be assessed in this course.*

Global Citizenship and Equity (GC&E) Outcomes

N/A

Text and other Instructional/Learning Materials

Text Book(s):

Casteel, Joan. 2013. Oracle 11g: PL/SQL Programming, 2nd Edition. Cengage Learning.
ISBN: 978-1133947363

Online Resource(s):

Bryla, B. and Loney, K. (2013) Oracle Database 12c. The Complete Reference
1st edition. (Osborne Oracle Press Series). McGraw-Hill Osborne Media.
ISBN 10: 0071801758
ISBN 13: 9780071801751

Available on SafariBooks On-Line

Evaluation Scheme

- Midterm: Weeks 1 - 6
- Assignment 1: Nested queries and sub-queries
- Assignment 2: Chapters 1 and 2
- Assignment 3: Create a stored procedure.
- Final Project: Final project may consist of the database programming functionality from a web application.
- Final Test: Weeks 8 - 13

Evaluation Name	CLO(s)	EES Outcome(s)	GCE Outcome(s)	Weight/100
Midterm	1, 2, 3	1, 2, 3, 4, 5, 7, 11		25
Assignment 1	2, 3	1, 2, 3, 4, 5, 7, 11		10
Assignment 2	2, 3, 4	1, 2, 3, 4, 5, 7, 11		10
Assignment 3	5			10

Final Project	2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11		20
Final Test	2, 3, 5	1, 2, 3, 4, 5, 7, 11		25
Total				100%

If students are unable to write a test they should immediately contact their professor or program Chair for advice. In exceptional and well documented circumstances (e.g. unforeseen family problems, serious illness, or death of a close family member), students may be able to write a make-up test.

All submitted work may be reviewed for authenticity and originality utilizing Turnitin®. Students who do not wish to have their work submitted to Turnitin® must, by the end of the second week of class, communicate this in writing to the instructor and make mutually agreeable alternate arrangements.

When writing tests, students must be able to produce official College photo identification or they may be refused the right to take the test or test results will be void.

Student Accommodation

It is College Policy to provide accommodation based on grounds defined in the Ontario Human Rights Code. Accommodation may include modifications to standard practices. Students with disabilities who require academic accommodations must register with the Centre for Students with Disabilities. Students requiring accommodation based on other human rights grounds should talk with their professors as early as possible. Please see the Student Accommodation Policy.

Use of Dictionaries

- Any dictionary (hard copy or electronic) may be used in regular class work.

Program or School Policies

N/A

Course Policies

N/A

College Policies

Students should familiarize themselves with all College Policies that cover academic matters and student conduct.

All students and employees have the right to study and work in an environment that is free from discrimination and harassment and promotes respect and equity. Centennial policies ensure all incidents of harassment, discrimination, bullying and violence will be addressed and responded to accordingly.

Academic honesty is integral to the learning process and a necessary ingredient of academic integrity. Academic dishonesty includes cheating, plagiarism, and impersonation. All of these occur when the work of others is presented by a student as their own and/or without citing sources of information. Breaches of

academic honesty may result in a failing grade on the assignment/course, suspension or expulsion from the college.

For more information on these and other policies, please visit www.centennialcollege.ca/aboutcentennial/college-overview/college-policies.

Students enrolled in a joint or collaborative program are subject to the partner institution's academic policies.

PLAR Process

This course is eligible for Prior Learning Assessment and Recognition (PLAR). PLAR is a process by which course credit may be granted for past learning acquired through work or other life experiences. The PLAR process involves completing an assessment (portfolio, test, assignment, etc.) that reliably demonstrates achievement of the course learning outcomes. Contact the academic school to obtain information on the PLAR process and the required assessment.

Semester: Fall 2016
Section Code: 001-004
Meeting Time & Location: 16F

Professor Name: Patrick Gignac
Contact Information: pgignac@centennialcollege.ca

Topical Outline (subject to change):

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
1	Introduction to course: Distribution and explanation of course outline. Review SQL DML and DDL.	Course Outline	Understand the course requirements, Students will be able to install and configure both the database and the client environment using Oracle Universal Installer.	Review of course outline, and hands-on demonstration of SQL Developer environment. Lecture and demonstration of Oracle 12c installation.		
2	Sequences Indexes Synonyms	Online material	Students will be able to write SQL commands to: Create and use sequences and synonyms. Understand the different types of indexes and how to create them.	Lecture on syntax in lecture periods, and practice exercises in lab class.		
3	Single row subqueries Multiple row subqueries Multiple column subqueries Null values Correlated subqueries Nested Subqueries Merge statements	Online materials	Students will be able to write SQL queries to group rows of data in a table. Students will be able to write: Advanced queries using correlated subqueries, EXISTS, inner and outer joins, and relational set operators such as UNION, INTERSECT, and MINUS.	Lecture on syntax in lecture periods, and practice exercises in lab class.		
4	Simple views Complex views Dropping a view	Online Materials	Students will be able to write complex SQL statements to: Create, alter, and drop tables, table columns, views, and indexes, and Manage tables, views, and indexes using tools such as clusters, sequences, etc.	Lecture on syntax in lecture periods, and practice exercises in lab class.	Assignment 1	

5	Application Models PL/SQL tools Database samples	Chapter 1 and 2 Introduction PL/SQL and Block Structures	Students will understand the basic PL/SQL structures such as conditional statements, loops, etc.	Lecture on syntax in lecture periods, and practice exercises in		

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
	PL/SQL Block Structures Variables Decision structures Loops			lab class.		
6	Query in a PL/SQL block Data retrieval DML statement in a block Record variables Collections of data Bulk processing	Chapter 3 Handling Data	Students will be able to write moderately complex PL/SQL programs, including cursors, and simple exception handling.	Lecture syntax in lecture periods, and practice exercises in lab class.	Assignment 2	
7	Review and Test	Online materials Review	Review and Test	Review and practice testing.	Midterm Test	
8	Implicit and explicit cursors Cursor variables Exception handlers Commenting code	Chapter 4 Cursors	Students will be able to write moderately complex PL/SQL programs, including cursors, and simple exception handling.	Lecture on contents and syntax in lecture periods, and practice exercises in lab class.		
9	Procedures Creating a procedure Calling a procedure Using describe and dbms_output Subprograms Scope of variables Error handling Removing procedures	Chapter 5 Procedures	Students will be able to write sophisticated business rules and application logic in the form of procedures.	Lecture on contents and syntax in lecture periods, and practice exercises in lab class.		

10	Creating a stored function Using the OUT parameter Multiple RETURN statements Passing parameter values Deleting program units	Chapter 6 Functions	Students will be able to write sophisticated business rules and application logic in the form of procedures and functions.	Lecture on chapter contents and syntax in lecture periods, and practice exercises in lab class.		

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
11	Packages Creating Packages Invoking package constructs Forward declarations in packages One time only procedures Managing SQL restrictions for packaged functions REF CURSOR Granting privileges Deleting packages.	Chapter 7 Packages	Students will be able to write sophisticated business rules and application logic in the form of packages.	Lecture on chapter contents and syntax in lecture periods, and practice exercises in lab class.	Assignment 3	
12	Local Dependency Activity Package dependencies Remote object dependencies Graning program unit priviliges Compilation.	Chapter 8 Dependencies, Privileges, Compilation	Students will understand the role of dependencies, privileges and compilation in PL/SQL structures.	Lecture on chapter contents and syntax in lecture periods, and practice exercises in lab class.		

13	Triggers Syntax Creating and testing Compound triggers ALTER trigger Deleting triggers	Chapter 9 Triggers	Students will be able to write application logic in the form of triggers.	Lecture on chapter contents and syntax in lecture periods, and practice exercises in lab class	Final Project Due	
14	Review and Final Test	Review materials.	Test	Review lecture.	Final Test	