Title: Database Design and Programming

Abbreviation and Number: CISB407
School: Business
Department: Computer Information Systems
Credits: 3
Course Sequence: (X) Fall ( ) Spring ( ) Fall and Spring

Hours Per Week:
   (3) Lecture
   ( ) Seminar
   ( ) Laboratory
   ( ) Studio
   ( ) Kitchen
   ( ) Other (Specify)

Pre-requisite(s): CISB307 or CIS307
Co-requisite(s): None

COURSE DESCRIPTION
This advanced database course focuses on SQL queries such as sub-queries and correlation, stored procedures, cursors, transaction management, distributed databases, data warehousing, XML, and database administration.

SPECIFIC OBJECTIVES
Upon successful completion of this course, students will be able to
1) develop advanced SQL queries including aggregation, partial joins, correlation, and sub-queries;
2) construct SQL queries to achieve maximum performance;
3) develop and use stored procedures and cursors;
4) implement transactions;
5) evaluate the concepts and methods of distributed databases and data warehouses;
6) examine the relationship between databases and Web/XML;
7) construct a Web interface to a database; and
8) execute database administration tasks such as backup, recovery, user management, and security.

COURSE CONTENT
I. Advanced SQL Queries I
   A. Ordering
   B. Grouping by
   C. Recursive
      i. Outer
      ii. Left
      iii. Right joins

II. Advanced SQL Queries II
   A. Subqueries
      i. Where
      ii. In
      iii. Having
      iv. Multi-row
      v. Attribute list
   B. Correlated queries
III. Stored Procedures, Cursors, Triggers
   A. Programming Language Constructs
   B. Declaration and use of variables
   C. Stored procedures
   D. Time functions
   E. Identity functions

IV. Transaction Management And Concurrency Control
   A. Introduction
   B. Uses and Recovery
   C. Problems
      i. Lost updates
      ii. Uncommitted data
      iii. Inconsistent retrievals
   D. Locking system
      i. Granularity
      ii. Types
      iii. Two-phase
      iv. Deadlocks

V. Data Performance Tuning
   A. Phases of Query Processing
   B. Determination of bottlenecks
   C. Index selectivity
   D. Condition expressions

VI. Distributed Databases
   A. Advantages
   B. Disadvantages
   C. Components
   D. Differing levels of data
   E. Process distributions
   F. Concurrency control
   G. Two-phase locking
   H. Design factors
      i. Data replication
      ii. Fragmentation
      iii. Allocation

VII. Business Intelligence And Data Warehouses
    A. Operational and Decision Support Data
    B. Warehousing architectures and requirements
    C. On-line Analytical Processing (OLAP)
    D. Star schemas
    E. Implementation
    F. Data Mining
VIII. Databases and The Web
   A. Web-to-database middleware
   B. Web server interfaces
   C. Web Application Servers
   D. XML
      i. Document Type Definitions (DTB)
      ii. Schemas

IX. Database Administration I
   A. Role of the Data Base Administrator (DBA)
   B. Developing security and administrative policies

X. Database Administration II
   A. Database object management
      i. Views
      ii. Tables
      iii. Triggers
      iv. Procedures
   B. Backup and recovery of databases

XI. Database Administration III
   A. Managing users
   B. Establishing security policies

ASSESSMENT
Tests...........................................................30%
Assignments.................................................. 20%
Project..........................................................20%
Final............................................................30%
Total..........................................................100%

REQUIRED TEXT

SUPPLEMENTARY READINGS/MATERIALS


Title: Database Design and Programming
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JOURNALS
ACM Transactions on database systems
ACM Transactions on Information and System Security
IEEE Transactions on Knowledge and Data Engineering
Journal of Computer Security, Data and Knowledge Engineering
Journal of Database Management (JDM)
Parallel and Distributed Database Journal

WEBSITES
http://camosun.ca/learn/calendar/current/web/comp.html
http://math.hws.edu/dept/cs_courses.html
http://cpd.viu.edu/undergraduate-studies-bachelor-of-computer-science/bachelor-of-computer-science/course-descriptions.html