SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: DATABASE PROGRAMMING USING SQL

CODE NO. : CSD220   **SEMESTER:** 4

PROGRAM: PROGRAMMER(2090)/PROGRAMMER ANALYST(2091)

AUTHOR: Dennis Ochoski

DATE: Jan, 2010   **PREVIOUS OUTLINE DATED:** Jan, 2009

APPROVED: "B. Punch"

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                          CHAIR   **DATE**

TOTAL CREDITS: 4

PREREQUISITE(S): CSD210

HOURS/WEEK: 4

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I. COURSE DESCRIPTION:

This course is a continuation of Database Design and Implementation I where more advanced design and implementation of systems will be completed. A major focus of the course is on the physical implementation and manipulation of databases. More advanced SQL (Structured Query Language) will be used for processing and managing relational databases. The DBMS platform that will be used is MySQL 5.0. Database design/modelling will be revisited to ensure the student has grasped the major concepts taught in the previous course. The course will also extend the concepts of database management to include such topics as managing multi-user databases and data warehouse design.

II. TOPICS TO BE COVERED:

1. Review of database design/modelling concepts.

2. Advanced Structured Query Language (SQL) with MySQL.

3. Managing Multi-User Database Environments.

4. Data Warehouses.

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III. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course the student will demonstrate the ability to:

1. Review the concepts of database design/modelling taught in the previous course.

   This learning outcome will comprise approximately **10%** of the course.

   Elements of the performance:

   - identify entities and allocate attributes to them
   - assign primary/unique identifiers to entities
   - understand how entities and relationships are represented
   - understand and apply cardinalities
   - understand and apply the following types of relationships

     i) one-to-one   ii)   one-to-many   iii)   many-to-many

   - understand how "user views" are related and combined to form an overall database design
   - create a database design/model and implement its physical representation

2. Discuss and apply the more advanced concepts related to SQL (Structured Query Language) using MySQL. (Kroenke: chapters 7 & 8 and lecture notes)

   This learning outcome will comprise approximately **75%** of the course.

   Elements of the performance:

   A)   apply the concepts of joins and subqueries by being able to:

   - create a join based upon conditions
   - create a join which joins a table to itself (self-join)
   - create a join that includes non-matching rows (outer join)
   - create a join of more than two tables
   - create a query with multiple levels
   - create a sub-query with comparison operators
   - create a sub-query for an existence test

B) apply the concepts of data definition and manipulation by being able to:

- create a table from an existing table
- insert data into a table
- update data in a table
- delete data from a table
- incorporate advanced data definition commands

C) apply the concepts of data control by being able to:

- control access to the server, a database, commands, and objects
- create and use views to control access
- update tables via views
- create rules, defaults, and constraints
- apply *triggers* to control updates

D) apply the more advanced concepts of MySQL Server by being able to:

- describe and use *stored procedures*
- explain and write transactions
- create users and assign access privileges
- explain and use backup and restore procedures on a database

3. Understand the role of data/database management with respect to multi-user database processing and learn techniques for controlling the consequences of concurrent data access. (Kroenke: chapter 9, 12 and lecture notes)

This learning outcome will comprise approximately **10%** of the course.

Elements of the performance:

- identify problems caused by concurrent processing
- explain methods to prevent loss of updates and the "deadly embrace"
- define the terms; logical transaction, before/after images, rollback/rollforward
- describe the problems related to database recovery
- explain methods for recovery after certain types of system failures
- describe the problems associated with database security and how database management software handles security implementation
- explain and implement object-oriented and subject-oriented security.

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Elements of the performance(cont'd):

• understand client/server computing
• understand the advantages of client/server systems
• understand how client/server systems evolved
• describe the components of a client/server system
• understand how client0/server systems might be introduced into an organization
• understand the factors that affect the implementation of client/server systems

4. Understand how a data warehouse is used to provide decision-support personnel with historical data needed for trend analysis. (Kroenke: chapter 15 and lecture notes)

This learning outcome will comprise approximately **5%** of the course.

Elements of the performance:

• describe the purpose and structure of a data warehouse
• differentiate between an operational database and a data warehouse
• differentiate between "snapshot" data and "ongoing" data with respect to the operational environment vs the data warehouse environment
• understand how data is transferred from the operational environment to the data warehouse
• understand the design and implementation of a data warehouse
• differentiate between a "data warehouse" and a "data mart"

IV.   REQUIRED RESOURCES/TEXTS/MATERIALS

Texts: Database Concepts
       4th edition, by David M. Kroenke and David J. Auer
       Pearson Publishing
       ISBN: 978-0-13-608653-6

Software: MySQL Server 5.0, and Query Browser 1.2,
              free download from www.mysql.com
                            www.mysql.com/documentation/index.html

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V.   EVALUATION PROCESS/GRADING SYSTEM:

Evaluation Methods	Weight
Quizzes	20%
Tests	50%
Assignments	30%
	100%

The following semester grades will be assigned to students in postsecondary courses:

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 - 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F(Fail)	below 50%	0.00

CR (Credit)	Credit for diploma requirements has been awarded.
S	Satisfactory achievement in field/clinical placement or non-graded subject area.
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

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VI. OTHER EVALUATION CONSIDERATIONS

1. In order to pass this course the student must obtain an overall test/quiz average of **50%** or better, as well as, an overall assignment average of **50%** or better. A student who is not present to write a particular test/quiz, and does not notify the professor beforehand of their intended absence, may be subject to a zero grade on that test/quiz.

2. There will be **no** supplemental or make-up quizzes/tests in this course.

3. Assignments must be submitted by the due date according to the specifications of the professor. Late assignments will normally be given a mark of zero. Late assignments will only be marked at the discretion of the professor in cases where there were extenuating circumstances.

4. Any assignment/projects submissions, deemed to be copied, will result in a **zero** grade being assigned to **all** students involved in that particular incident.

5. It is the responsibility of the student to ask the professor to clarify any assignment requirements.

6. The professor reserves the right to modify the assessment process to meet any changing needs of the class.

VII. SPECIAL NOTES:

Course Outline Amendments:
The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

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Retention of Course Outlines:
It is the responsibility of the student to retain all course outlines for possible
future use in acquiring advanced standing at other postsecondary institutions.

Prior Learning Assessment:
Students who wish to apply for advance credit transfer (advanced standing)
should obtain an Application for Advance Credit from the program coordinator
(or the course coordinator regarding a general education transfer request) or
academic assistant. Students will be required to provide an unofficial transcript
and course outline related to the course in question. Please refer to the Student
Academic Calendar of Events for the deadline date by which application must be made
for advance standing.

Credit for prior learning will also be given upon successful completion of a
challenge exam or portfolio.

Substitute course information is available in the Registrar's office.

Disability Services:
If you are a student with a disability (e.g. physical limitations, visual impairments,
hearing impairments, or learning disabilities), you are encouraged to discuss
required accommodations with your professor and/or the Disability Services
office. Visit Room E1101 or call Extension 2703 so that support services can be
arranged for you.

Communication:
The College considers **WebCT/LMS** as the primary channel of communication
for each course. Regularly checking this software platform is critical as it will
keep you directly connected with faculty and current course information.
Success in this course may be directly related to your willingness to take
advantage of the **Learning Management System** communication tool.

The professor reserves the right to use other tools and/or techniques that may
be more applicable. These other tools and/or techniques for effective
communication will be discussed, identified and presented throughout the
delivery of the course content.

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Plagiarism:
Students should refer to the definition of "academic dishonesty" in *Student Code of Conduct*. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade "C", (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Student Portal:
The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations. Announcements, news, the academic calendar of events, class cancellations, your learning management system (LMS), and much more are also accessible through the student portal. Go to https://my.saultcollege.ca.

Electronic Devices in the Classroom:
Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

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Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. *It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers may not be granted admission to the room.*

Absences due to medical or other unavoidable circumstances should be discussed with the professor, otherwise a penalty may be assessed. The penalty depends on course hours and will be applied as follows:

Course Hours	Deduction
5 hrs/week (75 hrs)	1.0% /hr
4 hrs/week (60 hrs)	1.5% /hr
3 hrs/week (45 hrs)	2.0% /hr
2 hrs/week (30 hrs)	3.0% /hr

Absentee reports will be discussed with each student. Final penalties will be reviewed and assessed at the discretion of the professor.