

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: **DATABASE PROGRAMMING USING SQL**

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

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

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DATE: **Jan, 2009** **PREVIOUS OUTLINE DATED:** **Jan, 2008**

APPROVED:

"B. Punch"

CHAIR **DATE**

TOTAL CREDITS: **4**

PREREQUISITE(S): **CSD210**

HOURS/WEEK: **4**

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(705) 759-2554, Ext. 2681

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 Database Environments.
4. Data Warehouses.

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 **5%** 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 **15%** 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.

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
3rd edition, by David M. Kroenke and David J. Auer
Pearson Publishing
ISBN: 0-13-198625-2

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

V. EVALUATION PROCESS/GRADING SYSTEM:

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

Outcome	Quizzes	Assignments/Labs	Total
outcome #1:	0%	5%	5%
outcome #2:	50%	25%	75%
outcome #3:	10%	5%	15%
outcome #4:	<u>5%</u>	<u>0%</u>	<u>5%</u>
	65%	35%	100%

Grade	Definition	Grade Point Equivalent
A+	90 - 100%	4.00
A	80 – 89.9%	4.00
B	70 – 79.9%	3.00
C	60 – 69.9%	2.00
D	50 – 59.9%	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.

VI. SPECIAL NOTES:

Disability Services:

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If you are a student with special needs (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.

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.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. 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.

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.

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

Assignment/Project Specific Information

1. Assignments/Projects will be assigned to student "assignment/project teams", each consisting of one, two or three students.
2. It is the responsibility of the project team to ask the professor to clarify any system requirements.
3. At various intervals, the professor will require each assignment/project team to report on the progress made on their respective assignment/project. At that time, each team member may be required to complete a Peer Evaluation Form used to "grade" each team member's contribution to the assignment/project.

VI. SPECIAL NOTES: (cont'd)

4. At the completion of an assignment/project, the respective assignment/project team may be asked to present and demonstrate the functionality of their system

to the user/professor.

5. The grade assigned to the overall assignment/project and to each team member will be determined using three sources:
 - a) Peer Evaluation Form
 - b) Presentation of project in class
 - c) Professor observation of classroom work

When an assignment/project is presented, each team member may be required to demonstrate his/her assigned task(s). The assignment/project will receive an overall grade and each team member will receive an individual grade that may or may not be equivalent to the overall assignment/project grade or to the grades of other team members.

Other Pertinent Information

1. In order to pass this course the student must obtain an overall quiz average of **50%** or better, as well as, an overall assignment/project average of **50%** or better. A student who is not present to write a particular quiz, and does not notify the professor beforehand of their intended absence, may be subject to a zero grade on that quiz.
2. There will be **no** supplemental or make-up quizzes/tests in this course.
3. Assignments/projects must be submitted by the due date according to the specifications of the professor. Late assignments/projects will normally be given a mark of zero. Late assignments/projects 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. The professor reserves the right to modify the assessment process to meet any changing needs of the class.

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.

VII. 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.

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