SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

COURSE TITLE:	**DATABASE DESIGN AND IMPLEMENTATION II**
CODE NO. :	**CSD303** **SEMESTER: 4**
PROGRAM:	**PROGRAMMER(2090)/PROGRAMMER ANALYST(2091)**
AUTHOR:	**Dennis Ochoski**
DATE:	**Jan, 2004** **PREVIOUS OUTLINE DATED: Jan, 2003**
APPROVED:	
	_____ _____
	DEAN **DATE**
TOTAL CREDITS:	**4**
PREREQUISITE(S):	**CSD204**
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 management of databases. The database processing language, SQL (Structured Query Language), will be used for creating and processing relational databases. The DBMS product that will be used to implement databases and learn SQL this semester will be MySQL. The course will also extend the concepts of database management to include such topics as managing multi-user databases, standard interfaces for accessing database servers, and data warehouses. The course will begin with a review of data modelling and design techniques learned in CSD204.

II. TOPICS TO BE COVERED:

1. Review of data modelling techniques.
2. Transforming E-R Model designs into a physical implementation using MySQL.
3. Advanced Structured Query Language (SQL) with MySQL.
4. Standard Interfaces for accessing databases.
5. Managing Multi-User Databases.
6. 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. Recall and apply data modelling and design techniques learned in CSD204.

   This learning outcome will comprise approximately **20%** of the course.

   Elements of the performance:

   - apply design techniques learned previously to model a case situation that will be used as a foundation to learn material covered in this course.

2. Transform E-R data models into a physical relational design using MySQL. (Kroenke - chapter 6: pgs. 191 – 199 , chapter 8)

   This learning outcome will comprise approximately **15%** of the course.

   Elements of the performance:

   - define and apply the concepts of the following terms:

     i) tree structure ii) simple network iii) complex network

   - describe and implement one-to-many relationships in MySQL, and, explain how these relationships facilitate the retrieval of information
   - describe and implement many-to-many relationships in MySQL, and, explain how these relationships facilitate the retrieval of information
   - transform entire E-R models into physical relational designs
   - describe the relationship of database structure and application program design
   - understand the need for database redesign
   - redesign existing databases

3. Discuss and apply the more advanced concepts related to Structured Query Language (SQL) using MySQL.
   (Kroenke: chapter 6 pgs. 200 – 218, chapters 7 and 8, chapter 14 pgs. 529 – 535 and, lecture notes)

   This learning outcome will comprise approximately **45%** 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

   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
   - explain and use backup and restore procedures on a database

4. Understand the emerging technologies that are relevant to database processing. (Kroenke: chapter 12 and lecture notes)

   This learning outcome will comprise approximately **3%** of the course.

   Elements of the performance:

   - understand the nature and characteristics of the data environment that surrounds Internet technology database applications
   - learn the purpose, features, and facilities of ODBC and OLE DB

5. Understand the special needs of multi-user database processing and learn techniques for controlling the consequences of concurrent data access. (Kroenke: chapter 9, and lecture notes)

   This learning outcome will comprise approximately **12%** 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 image, after image, rollback, and 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 object-oriented and subject-oriented security.
   - understand client/server database architecture and know the components of client/ server systems and the role of each component
   - describe the characteristics of other various multi-user processing architectures such as centralized, shared, and file-server
   - understand why client/server systems have advantages over other architectures

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

   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 "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

Text: DATABASE PROCESSING: Fundamentals - Design - Implementation,
9th edition, by David M. Kroenke Prentice Hall Publishing
ISBN: 0-13-101514-1

Web Site References: www.mysql.com
www.mysql.com/documentation/index.html

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V. EVALUATION PROCESS/GRADING SYSTEM:

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

Outcome	Quizzes	Assignments	Project	Total
outcome #1:	5%	5%	10%	20%
outcome #2:	5%	5%	5%	15%
outcome #3:	20%	15%	10%	45%
outcome #4:	3%	0%	0%	3%
outcome #5:	12%	0%	0%	12%
outcome #6:	5%	0%	0%	5%
	50%	25%	25%	100%

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)	49% and below	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. SPECIAL NOTES:

Special Needs:
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 Special Needs office. Visit Room E1101 or call Extension 493 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.

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.

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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.

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VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.