SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

COURSE TITLE: **DATABASE DESIGN AND IMPLEMENTATION I**

CODE NO. : **CSD204** **SEMESTER: 3**

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

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APPROVED:

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DEAN **DATE**

TOTAL CREDITS: **6**

PREREQUISITE(S): **CSA101**

HOURS/WEEK: **4**

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DATABASE DESIGN AND IMPLEMENTATION I — CSD204
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I. COURSE DESCRIPTION:

This course focuses on the data modelling skills required to effectively design and implement database-oriented systems.

The course begins with a study of the necessary terminology and concepts to gain an appreciation of databases/database management systems. Data modelling and design skills are developed through methods used to properly identify entities, define logical relationships among entities, and to properly assign attributes to entities.

Practical skills are developed through the study and use of the Entity-Relationship Model and the Semantic Object Model. A case study will be used to illustrate the analysis, design, and implementation of a database system. The physical implementation will accomplished using Microsoft Access 2000.

II. TOPICS TO BE COVERED:

1. Database Processing vs Traditional File Processing.

2. Data Modelling with the Entity-Relationship Model.

3. Data Modelling with the Semantic Object Model.

4. The Relational Model and Normalization.

5. Transforming E-R Model designs and Semantic Object Model designs into a physical implementation using Microsoft Access 2000.

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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. Understand the problems with traditional file processing systems and how database oriented systems provide solutions to those problems.
(chapters 1 and 2, chapter 3: pgs. 49 - 51 in Kroenke; handouts)

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

   Elements of the performance:

   - define or describe the meanings of the following terms:

     i) database
     ii) database management system
     iii) data redundancy
     iv) data integrity
     v) schema
     vi) subschema
     vii) internal view
     viii) entity
     ix) attribute
     x) primary key

   - compare database processing with file processing
   - understand the disadvantages of traditional file processing
   - understand the advantages and disadvantages of database processing
   - identify and describe the functions of a database management system
   - identify the role of various components of a database system
   - identify and name elementary entities in a user's environment
   - differentiate between an entity type and entity occurrence
   - allocate attributes to their respective entities
   - differentiate entity occurrences by assigning primary/unique keys to those occurrences

2. Apply the Entity-Relationship Model for modelling business data requirements.
(chapter 3 – Kroenke; handouts)

   This learning outcome will comprise approximately **35%** of the course.

   Elements of the performance:

   - relate this course to systems analysis and design
   - define and apply the concepts of the following terms:

Elements of the performance(cont'd):

i)	Entity-Relationship Model	v)	conceptual model	ix)	category types
ii)	relationship	vi)	logical model		
iii)	cardinality	vii)	physical model		
iv)	view	viii)	subtype/supertype		

- understand the importance for data modelling and design tools and techniques
- understand how entities and relationships are represented
- understand and apply connectivities and 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
- demonstrate the use of E-R diagrams to build a data model

3. Apply the Semantic Object Model for modelling business data requirements. (chapter 4 - Kroenke)

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

   Elements of the performance:

- define and apply the concepts of the following terms:

i)	Semantic Object Model	v)	object property
ii)	object	vi)	non-object property
iii)	object diagram	vii)	multi-valued property
iv)	property	viii)	domain

- define and illustrate the six basic types of semantic objects
- demonstrate the use of object diagrams to build a data model

4. Understand anomalies and the need for normalization through application of the Relational Model. (chapter 5 - Kroenke)

   This learning outcome will comprise approximately **25%** of the course.

   Elements of the performance:

   - define and apply the concepts of the following terms:

     i) relation/row/column
     ii) attribute
     iii) normal forms
     iv) modification anomalies
     v) functional dependency
     vi) determinant
     vii) primary key/foreign key/candidate key
     viii) referential integrity

   - understand anomalies and the need for normalization
   - understand how to assign primary keys to tables
   - determine the functional dependencies among attributes
   - compose relations applying the concepts of normalization and functional dependencies

5. Transform E-R data models and Semantic Object data models into a physical relational design using Microsoft Access 2000.
   (chapters 6, 7, 9 and 10 – Kroenke)

   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

   - understand how trees, simple networks and complex networks are represented
   - transform E-R models into physical relational designs
   - transform Semantic Object models into physical relational designs
   - describe the relationship of database structure and application program design
   - distinguish between bound, unbound , and calculated controls; and implement each in a form
   - modify an existing form to include a combo box, command buttons, and colour
   - describe the similarities between forms and reports with respect to bound, unbound, and calculated controls

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Elements of the performance(cont'd):

- explain the use of multiple criteria rows within the QBE grid to implement And and Or conditions in a query
- understand and relate the use of SQL (Structured Query Language) to the creation and processing of databases

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IV. EVALUATION METHODS:

The mark for this course will be arrived at as follows:

Quizzes:		
Quiz 1:	outcome #1	10%
Quiz 2:	outcome #2	20%
Quiz 3:	outcome #3	10%
Quiz 4:	outcomes #4 & #5	15%
Assignments:		
Asgn 1:	outcome #2	5%
Asgn 2:	outcome #2	10%
Asgn 3:	outcome #3	5%
Asgn 4:	outcome #4	5%
Group Project		20%
	Total	100%

The grading scheme used will be as follows:

A+	90 - 100%	Outstanding achievement
A	80 - 89%	Excellent achievement
B	70 - 79%	Average achievement
C	60 - 69%	Satisfactory achievement
R	< 60%	Repeat the course
X	Incomplete	A temporary grade limited to special circumstances that have prevented the student from completing the objectives by the end of the semester. An X grade reverts to an R grade if not upgraded within a specified time period.
NR	No report.	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when for extenuating circumstances, it has not been possible for the faculty member to report grades.

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ELIGIBILITY FOR XGRADES/UPGRADING OF INCOMPLETES

When a student's course work is incomplete or final grade is below 60%, there is the possibility of upgrading to a pass when a student meets all of the following criteria:

1. The student's attendance has been satisfactory.
2. An overall average of at least 50% has been achieved.
3. The student has not had a failing grade in all of the theory tests taken.
4. The student has made reasonable efforts to participate in class and complete assignments.

NOTE: **The opportunity for an X grade is usually reserved for those with extenuating circumstances.** The nature of the upgrading requirements will be determined by the instructor and may involve one or more of the following: completion of existing labs and assignments, completion of additional assignments, re-testing on individual parts of the course or a comprehensive test on the entire course.

ASSIGNMENTS
Required format for lab assignments will be detailed by the instructor before labs are assigned.

ATTENDANCE:
Absenteeism will affect a student's ability to succeed in this course. Absences due to medical or other unavoidable circumstances should be discussed with the instructor. There will be an attendance factor included in the lab evaluation.

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V. ASSIGNMENT/PROJECT SPECIFIC INFORMATION

1. Assignments/Projects will be assigned to student "assignment/project teams", each consisting of one, two, three or four students.

2. It is the responsibility of the project team to ask the instructor to clarify any system requirements.

3. At various intervals, the instructor 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.

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/instructor.

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 to instructor(s)
    c) Instructor observation of classroom work

** Note: When an assignment/project is presented to the instructor, 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 which may or may not be equivalent to the overall assignment/project grade or to the grades of other team members.

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VI. SPECIAL NOTES

1. In order to pass this course the student must obtain an overall quiz average of **60%** or better, as well as, an overall assignment average of **60%** or better. A student who is not present to write a particular quiz, and does not notify the instructor 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 at the end of the semester .

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

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

5. Students with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor and/or the Special Needs office. Visit Room E1204 or call extension 493, 717, or 491 so that support services can be arranged for you.

6. Your instructor reserves the right to modify the course outcomes and/or the assessment process to meet the needs of the course.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor.

VIII. REQUIRED RESOURCES/TEXTS/MATERIALS

Text: DATABASE PROCESSING: Fundamentals - Design - Implementation, 8th edition,
by David M. Kroenke Prentice Hall Publishing

Reference Text: Last year's text used in CSA101
Microsoft Access 2000: Complete Concepts and Techniques
by Shelly and Cashman