

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**CICE COURSE OUTLINE**

**COURSE TITLE:** Database Modeling  
**CODE NO. :** CSD210 **SEMESTER:** Fall  
**MODIFIED CODE:** CSD0210

**PROGRAM:** Computer Programmer/Programmer Analyst

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**MODIFIED BY:** Anthea Fazi, Learning Specialist CICE Program

**DATE:** Sept/2016 **PREVIOUS OUTLINE DATED:** 2015

**APPROVED:** "Angelique Lemay" Oct/16

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**DEAN**

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**DATE**

**TOTAL CREDITS:** Four

**PREREQUISITE(S):** CSD102

**HOURS/WEEK:** Four

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*For additional information, please contact the Dean, School of Community Services Interdisciplinary Studies, Curriculum & Faculty Enrichment*  
*(705) 759-2554, Ext. 2737*

## I. COURSE DESCRIPTION:

This course will emphasize the importance of database design prior to implementation. The CICE student, with assistance from a Learning Specialist, will learn to capture and model the user's data environment through the analysis and design of relational databases using the Entity-Relationship Model and normalization techniques. Database models will be physically implemented using a relational DBMS and SQL (Structured Query Language). To understand the database development process, the following concepts will be discussed: conceptual model, logical model, entities, attributes, relationships, cardinalities, primary and foreign keys, normalization, and data integrity.

## II. TOPICS TO BE COVERED:

1. Database Processing vs Spreadsheet/File Processing.
2. Data Modelling and Design with the Entity-Relationship Model.
3. The Relational Model and Normalization.
4. Transforming E-R Model Designs into a Physical Implementation.
5. Data Definition and Manipulation using SQL.

## III. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the CICE student, with the help of a Learning Specialist, will demonstrate the basic ability to

1. Understand the problems with spreadsheet/file processing systems and how database oriented systems provide solutions to those problems.  
(chapter 1- Kroenke and Auer)

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

Elements of the performance:

- define/describe the following terms:
  - i) database
  - iii) data redundancy

ii) database management system                      iv) data integrity

- compare database processing with spreadsheet/file processing
- understand the disadvantages of spreadsheet/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

2. Understand the Relational Database Model and apply the Entity-Relationship Model for modelling business data requirements.

(chapter 4 – Kroenke and Auer)

This learning outcome will comprise approximately 55% of the course.

Elements of the performance:

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

i)	Entity-Relationship Model	vii)
	internal/physical model	
ii)	entity	
	viii) weak entity	
iii)	attribute	
	ix) category types	
iv)	relationship	
	x) supertypes/subtypes	
v)	external/user view (subschema)	xi)
	cardinality	
vi)	conceptual/logical model (schema)	xii) domain
xiii)	recursive	

Elements of the performance(cont'd):

- understand the importance for data modelling and design tools and techniques
- identify and name 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 identifiers to those occurrences
- understand how entities and relationships are represented
- understand and apply connectivity's and cardinalities
- understand and apply the following types of binary 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
- use Microsoft Visio to create E-R diagrams (data models)

3. Understand anomalies and the need for normalization through application of the Relational Model.  
(chapter 2 – Kroenke and Auer)

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

Elements of the performance:

- define and apply the concepts of the following terms:
 

i) relation/row/column dependency	v) functional
ii) attribute determinant	vi)
iii) normal forms	vii) primary
iv) key/foreign key/candidate key	viii) referential integrity
iv) modification anomalies	
- understand anomalies and the need for normalization
- understand how to assign primary keys to tables
- determine the functional dependencies among attributes
- understand the goal of domain key normal form
- compose relations applying the concepts of normalization and functional dependencies

4. Transform E-R data models into a physical relational design and perform data manipulation. (chapters 3 and 5, Appendix B – Kroenke and Auer)

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

Elements of the performance:

- create tables from the entities defined in the E-R Model and the list of attributes assigned to those entities
- define primary and secondary keys for each table
- implement one-to-one, one-to-many, and many-to-many relationships, and, explain how these relationships facilitate the retrieval of information

- enforce referential integrity constraints
- query a database retrieving row and column data (SELECT...)
- query a database using conditions to restrict the data retrieved (SELECT...WHERE...)
- rename column headings in the retrieved data
- use aggregate functions such as AVG, COUNT, MIN, MAX, and SUM
- organize data into groups (GROUP BY)
- set conditions on groups (HAVING)
- create queries involving two or more tables using both “joins” and “sub queries”
- insert data into a table (INSERT)
- update data in a table (UPDATE)
- delete data from a table (DELETE)

#### IV. REQUIRED RESOURCES/TEXTS/MATERIALS

The specific book information for this course text is as follows:

Title: Database Concepts,  
7th Edition, by David Kroenke and David Auer  
Pearson Publishing

eText: ISBN-13 978-0-13-354486-2

Print: ISBN-13 978-0-13-354462-6

Option 1: Purchase a subscription to a digital copy (eBook).

The student can purchase a web version or a downloadable version. The most common subscription timeframe is 180 days but this varies depending on the text, publisher and/or web site. After the subscription timeframe has expired, the student no longer can access the text unless they extend/renew the subscription. If the bookstore offers an e-version of the text, the subscription timeframe is unlimited, but the subscription cost may be greater. The advantages of the eBook version over the hardcopy version are twofold: savings of approximately 40% – 60%, and, no physical text to carry.

eBook Links: <https://www.vitalsource.com/student-etextbooks>

Option 2: Purchase a hardcopy.

The student may choose to purchase a hardcopy of the text from the bookstore.

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Software: MySQL Workbench 6.3.3 (GUI Tool)  
free download from  
<http://www.mysql.com/downloads/workbench/>  
MySQL Community Edition 5.6.24 (DBMS)

V.  
EVALUATION PROCESS/GRADING SYSTEM:

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

	Evaluation Methods	Weight
	Tests 60%	
	Assignments/Labs	40%
100%		

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

	Grade	Grade	Definition	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.

## 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, and, in such cases, a late penalty of 10% per day will be assessed.
4. Any assignment/projects submissions, deemed to be copied, will result in a zero grade being assigned to all students involved in a 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  
In order to meet any changing needs of the class.

## VII. SPECIAL NOTES

All tests and assignments will be completed with the assistance of the Learning Specialist. Any modifications to the tests and assignments will be proposed by the Learning Specialist and are subject to approval from the professor

### 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 enclosed, 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. Students are required to be in class on time and attendance will be taken within the first five minutes of class. A missed class will result in a penalty in your marks unless you have discussed your absence with the professor as described above.

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

#### VIII. COURSE OUTLINE ADDENDUM

The provisions contained in the addendum located on D2L form part of this course outline.



**CICE Modifications:****Preparation and Participation**

1. A Learning Specialist will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Learning Specialist may not attend all classes with the student(s), support will always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

**A. Tests may be modified in the following ways:**

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

**B. Tests will be written in CICE office with assistance from a Learning Specialist.*****The Learning Specialist may:***

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

**C. Assignments may be modified in the following ways:**

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

***The Learning Specialist may:***

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

**D. Evaluation:**

Is reflective of modified learning outcomes.