SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: DATABASE MANAGEMENT I

CODE NO.: CSD204 **SEMESTER:** WINTER 99

PROGRAM: COMPUTER PROGRAMMER/PROGRAMMER ANALYST

INSTRUCTOR: DENNIS OCHOSKI

DATE: JANUARY 1999 **PREVIOUSLY DATED:** JANUARY 1998

APPROVED: K. DeRosario
DEAN

Jan. 4/99
DATE

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TOTAL CREDITS: 6

PREREQUISITE(S): CSA101, CSD202

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 by defining logical relationships among entities using the Entity-Relationship Model, and defining objects using the Semantic Object Model.

Practical skills are developed through the study and use of MicroSoft Access, a relational database management system. Case studies will be used to illustrate the analysis, design, and implementation of a database system.

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.
6. Database Implementation with MicroSoft Access.

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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 - Kroenke)

   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

   - 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

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

   This learning outcome will comprise approximately **30%** 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
     ii) entity
     vi) conceptual model
     vii) logical model

Elements of the performance(cont'd):

iii)	relationship	viii)	physical model
iv)	cardinality	ix)	recursive relationship
v)	view	x)	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 **20%** 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
- compare the Entity Relationship Model to the Semantic Object Model

4. Understand anomalies and the need for normalization through application of the Relational Model. (chapter 5 - 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) 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 relational, DBMS-independent designs.
   (chapters 6 and 7 - Kroenke)

   This learning outcome will comprise approximately **10%** 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 in the Relational Model
   - transform E-R models into relational designs
   - transform Semantic Object models into relational designs

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6. Create a database in MicroSoft Access and design appropriate applications to process that database. (chapter 8 – Kroenke, chapters 1 to 5 - Grauer & Barber)

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

Elements of the performance:

- understand the basic characteristics and functions of database applications
- explain the role of a database application in object materialization
- define application control mechanism design alternatives
- understand principles of form and report design
- describe the relationship of database structure and application program design
- create a database and design its appropriate tables
- add, edit, and delete records within a table
- describe and apply the data types and properties within Access
- use the Table Wizard to create and update a table
- discuss the importance of data validation and how it is implemented in Access
- use the Table Wizard to create predefined forms
- distinguish between a bound control, an unbound control, and a calculated control; and implement each type 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
- list the sections that may be present in a report and explain the purpose of each
- differentiate between a query and a table; explain how the objects in an Access database (ie. tables, forms, queries, and reports) interact with one another
- use the Query By Example (QBE) grid to create and modify a select query
- explain the use of multiple criteria rows within the QBE grid to implement And and Or conditions in a query
- use the Relationships window to implement a one-to-many relationship
- define referential integrity and explain how its enforcement maintains consistency within a database
- distinguish between a main form and a subform; explain how a subform is used in conjunction with a one-to-many relationship and use the Form Wizard to create a subform
- create a report based on a query
- create a main and a subform based on a query and discuss the advantage of using queries rather than tables as the basis for a form or report
- create a parameter query and explain how it can be made to accept multiple parameters
- use aggregate functions in a select query

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IV. EVALUATION METHODS:

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

Quizzes:	
outcome #1	10%
outcome #2	20%
outcome #3	15%
outcomes #4 & #5	15%
Assignments (3 @ 5%)	15%
Group Project	25%
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.

2. It is the responsibility of the project team to clarify any system requirements with the instructor. On their respective assignment/project. At that time, each team member will be required to complete a Peer Evaluation Form used to "grade" each team member's contribution to the project.

4. At the completion of a project, the respective project team will present and demonstrate the functionality of their system to the 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)

** Note: When a project is presented to the instructor, each team member will be required to demonstrate his/her assigned task(s). The 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 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.

2. 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.

3. The instructor reserves the right to modify the assessment process to meet any changing needs of the class. Consultation with the class will be done prior to any changes.

4. The method of upgrading an incomplete grade is at the discretion of the instructor, and may consist of such things as make-up work, rewriting tests, and comprehensive examinations.

5. Students with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

6. Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.

VII. PRIOR LEARNING ASSESSMENT:

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

VIII. REQUIRED STUDENT RESOURCES

Texts: DATABASE PROCESSING: Fundamentals - Design - Implementation, 6th edition,
by David M. Kroenke
Prentice Hall Publishing

EXPLORING MICROSOFT ACCESS for Windows 95, Version 7.0,
by Robert Grauer and Maryann Barber
Prentice Hall Publishing