

**SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY**

SAULT STE. MARIE, ONTARIO

**COURSE OUTLINE**

Course Title: **DATABASE MANAGEMENT AND DESIGN**  
Course No.: **CSD304**  
Program: **COMPUTER ENGINEERING TECHNOLOGY**  
Semester: **FIFTH (5)**  
Date: **SEPTEMBER 1997**

Author: **FRANK TURCO**

Previous Outline

Dated: **SEP 1996**

APPROVED:

  
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Dean

\_\_\_\_\_  
Date

TOTAL CREDITS: 5

TOTAL CREDIT HOURS: 80

PREREQUISITES: Completion of the Computer Engineering Technician Program or approval of the Dean.

LENGTH OF COURSE: 4 Hours per Week comprised of:  
2 - 1 hour lecture class with the Professor  
1 - 2 hour lab work period with the Professor



C O U R S E O U T L I N EI. Course Description

This course is to provide students the opportunity to study database processing fundamentals as well as investigate a variety of approaches to database management.

A study of database management system theory will parallel the application of the theory in lab projects. A representative Relational Database system and data manipulation language will be studied. The students will also apply their knowledge of the CDD (Common Data Dictionary) to centralise data definitions for the systems they will create. The course is intended to deal with Database management issues at a fairly detailed level.

II. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE:

(Generic Skills Learning Outcomes placement on the course outline will be determined and communicated at a later date.)

**A. Learning Outcomes:**

1. Explain the difference between traditional file processing and data base management as well as the components and concepts that relate to database management.
2. Design a variety of data base models based on data normalization techniques.
3. Produce various programs that will extract and manipulate data from Databases through the use of Data Manipulation languages such as SQL on a PC Based Database tool such as Access and/or Salsa.
4. Introduction to the emerging technologies and applications relating to Databases such as ODBC, Data Warehousing, Intranet and Internet Databases, Multimedia Databases, Object Databases, Enterprise Modelling and SQL3.



II. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE (Continued):

## B. Learning Outcomes and Elements of Performance:

1. Explain the difference between traditional file processing and data base management as well as the components and concepts that relate to database management.

*Potential elements of the performance:*

- Describe the nature of database processing and file processing.
- Describe the limitations of traditional file processing and the difference between flat files and non-flat files.
- Discuss the advantages and disadvantages of database processing.
- Identify and describe the functions of a database management system.
- Describe what a Data Base Management System (DBMS) is.
- Identify and appreciate the different functions of a Generic DBMS.
- Identify the different types of DBMS's (Hierarchical versus Relational).
- Describe what a Database application is?
- Define and apply the terms schema, sub-schema, logical view, and physical view.

This will constitute approximately 15 % of the course grade (possible weighting strategy) and take approximately 2 weeks.



II. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE (Continued) :**B. Learning Outcomes and Elements of Performance  
(Continued) :**

2. Design a variety of data base models based on data normalization techniques.

***Potential elements of the performance:***

- Describe the concept of the physical properties of data as it relates to defining objects and domains.
- Describe terms such as:
  - relations, normalization,
  - modification anomalies,
  - keys (and how to apply them in database definition),
  - attributes,
  - functional dependencies, uniqueness
- Demonstrate the differences between the various Normal forms of Data.
- Describe and appreciate the following Attribute relationships:
  - One-to-one
  - Many-to-one
  - Many-to-many
- Define compatible and noncompatible unions, differences and intersections of data.
- Develop and implement in a team atmosphere, various models of data and databases.
- Describe and appreciate the process of Object Oriented Data Modelling and use it in Database Design.
- Design and develop semantic object models of data.
- Design and develop object oriented models of data.
- Design and develop entity relationship models of data.

This will constitute approximately 45 % of the course grade (possible weighting strategy) and take approximately 7 weeks.



II. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE (Continued):**B. Learning Outcomes and Elements of Performance  
(Continued):**

3. Produce various programs that will extract and manipulate data from Databases through the use of Data Manipulation languages such as SQL on a PC Based Database tool such as Access and/or Salsa.

***Potential elements of the performance:***

- Use the Common data dictionary, and Entity relationship diagrams to create effective and structured database tables.
- Define forms that allow adding, modifying, viewing and deleting of data from multiple tables.
- Design applications that allow a user to manipulate data within the context of a Database environment such as Access and/or Salsa.
- Develop and implement a variety of structured queries using SQL.
- Illustrate the significance

This will constitute approximately 30 % of the course grade (possible weighting strategy) and take approximately 4 weeks.



II. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE (Continued) :**B. Learning Outcomes and Elements of Performance  
(Continued) :**

4. Introduction to the emerging technologies and applications relating to Databases such as ODBC, Data Warehousing, Intranet and Internet Databases, Multimedia Databases, Object Databases, Enterprise Modelling and SQL3.

***Potential elements of the performance:***

- Illustrate the various non-traditional implementations of databases.
- Define and describe various emerging aspects and database implementations.
- Define and design databases in the context of
  - Open Database Connectivity (ODBC)
  - Data Warehousing
  - Intranet and Internet
  - Multimedia Applications
  - Enterprise
- Appreciate the significance SQL has had on database development.

This will constitute approximately 10 % of the course grade (possible weighting strategy) and take approximately 2 weeks.

III. TOPICS TO BE COVERED

- \* NOTE: These topics sometimes overlap several areas of skill development and are not necessarily intended to be explored in isolated learning units or in the order below.

TOPICS	APPROXIMATE TIME
1. Database Management Concepts	3 WEEKS
2. Database Design and Data Modelling	7 WEEKS
3. Database Development and SQL Programming	4 WEEKS
4. Emerging Database Technologies	2 WEEKS



IV. REQUIRED STUDENT RESOURCESTEXTBOOKS TO BE USED AS REFERENCE MATERIAL:

- "Database Processing" by David Kroenke , Prentice Hall,  
Sixth Edition, 1994

ADDITIONAL RESOURCE MATERIALS

Additional reference material will either be given to the students or placed in the library for the student's use.

Handouts, Guidance, and Material as it relates to the individual topics.

Use of research modes such as INTERNET, Library Data Base Searches, and articles.

REQUIRED INDIVIDUAL STUDENT RESOURCES

Participation & Teamwork  
Box of Disks  
Individual Research  
Documentation

V. EVALUATION METHODS:

Tests and Quizzes	60%
Assignments and Lab Work	40%

The tentative breakdown is as follows:

3	Formal Theory Tests	at 15 % each
3	Quizzes (best 3 out of 4) (quizzes may be either in written or practical form)	at 5 % each
4	Assignments	at 5 % each
2	Assignments	at 10 % each

Some minor modifications to the above percentages may be necessary. The professor reserves the right to adjust the mark up or down 5% based on attendance, participation, leadership, creativity and whether there is an improving trend.



V. EVALUATION METHODS (Continued) :

- \* All Assignments must be completed satisfactorily to complete the course. Late hand in penalties will be 5% per day. Assignments will not be accepted past one week late unless there are extenuating and legitimate circumstances.
- \* The professor reserves the right to adjust the number of tests, practical tests and quizzes based on unforeseen circumstances. The students will be given sufficient notice to any changes and the reasons thereof.
- \* A student who is absent for 3 or more times without any valid reason or effort to resolve the problem will result in action taken.

NOTE: If action is to be taken, it will range from marks being deducted to a maximum of removal from the course.



V. EVALUATION METHODS (Continued):GRADING DETAILS1. TESTS

Written tests will be conducted as deemed necessary; generally at the end of each block of work. They will be announced about one week in advance. Quizzes may be conducted without advance warning.

2. ASSIGNMENTS

Assignments not completed by the assigned due-date will be penalised by 5% per day late. All assignments must be completed satisfactorily to complete the course.

3. GRADING SCHEME

A+	90 - 100%	Outstanding achievement
A	80 - 89%	Excellent achievement
B	70 - 79%	Average Achievement
C	55 - 69%	Satisfactory Achievement
U	Incomplete: Course work not complete at Mid-term. Only used at mid-term.	
R	Repeat	
X	A temporary grade that is limited to instances where special circumstances have prevented the student from completing objectives by the end of the semester. An X grade must be authorised by the Chairman. It reverts to an R if not upgraded in an agreed-upon time, less than 120 days.	

4. UPGRADING OF INCOMPLETE

When a student's course work is incomplete or final grade is below 55%, there is the possibility of upgrading to a pass when the student's performance warrants it. Attendance and assignment completion will have a bearing on whether upgrading will be allowed. A failing grade on all tests will remove the option of any upgrading and an R grade will result. The highest grade on re-written tests or assignments will be 56%.

Where a student's overall performance has been consistently unsatisfactory, an R grade may be assigned without the option of make-up work.



V. EVALUATION METHODS (Continued):

The method of upgrading is at the discretion of the teacher and may consist of one or more of the following options: assigned make-up work, re-doing assignments, re-writing of tests, or writing a comprehensive supplemental examination.

VI. SPECIAL NOTES

1. All students should be aware of the Special Needs Office in the College. If you have any special needs such as being visually impaired, hearing disabled, physically disabled, learning disabilities you are encouraged to discuss required accommodations confidentially with the Professor and/or contact the Special Needs Office, Room E1204, Ext. 493, or 717, or 491 so that support services can be arranged for you.
2. Your professor reserves the right to modify the course as he/she deems necessary to meet the needs of students.
3. It is the responsibility of the student to retain all course outlines for possible future use in gaining advanced standing at other post-secondary institutions.
4. Plagiarism  
Student should refer to the definition of "academic dishonesty" in the "Statement of 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, as may be decided by the professor.
5. Substitute course information is available at the Registrar's office.
6. Students must achieve a passing grade in **both** the assignment and the test portions of the course.
7. The topics will not necessarily be covered in the order shown in this course outline.



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

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