

CET301

DATABASE MANAGEMENT AND DESIGN

TOTAL CREDITS: 5

PREREQUISITES:

The two year Technician diploma or  
permission granted by the Dean.

II. PHILOSOPHY/GOALS

This course is to provide students the opportunity to study  
database programming and design. The course covers a variety  
of approaches to database management.

**SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY**

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A study of database management systems theory will parallel the  
application of the theory in lab projects. A representation  
Relational Database system and data manipulation language will be  
studied. The student will also apply their knowledge of the CDB  
(Common Data Dictionary) to generate data definitions for the  
systems they will create. A detailed level.

**COURSE OUTLINE**

**Course Title:** DATABASE MANAGEMENT AND DESIGN

**Course No.:** CET301 **Semester:** 5

**Program:** COMPUTER ENGINEERING TECHNOLOGY

**Date:** FALL 1994

**Author:** FRANK TURCO

**Date:** SEPT 1994 **Previous Outline Date:** JAN 1994

**APPROVED:**

*F. Turco*  
Dean

94-08 20  
Date

**DATABASE MANAGEMENT AND DESIGN**

**CET301**

**TOTAL CREDITS:        6**

**PREREQUISITES:                The two year Technician Diploma or  
                                  Permission granted by the Dean.**

**I.    PHILOSOPHY/GOALS**

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 centralize data definitions for the systems they will create. The course is intended to deal with Database management issues at a fairly detailed level.

**II.   STUDENT PERFORMANCE OBJECTIVES (OUTCOMES)**

Upon successful completion of this course the student will:

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 RDO and SQL.

**III.   TOPICS TO BE COVERED**

**APPROXIMATE TIME**

- |                                      |         |
|--------------------------------------|---------|
| 1. Database Management Concepts      | 3 WEEKS |
| 2. Database Design and Data Modeling | 6 WEEKS |
| 3. RDO and SQL Programming           | 6 WEEKS |

**IV. LEARNING ACTIVITIES / REQUIRED RESOURCES****TOPIC 1 DATABASE MANAGEMENT CONCEPTS**

During this block the student will study the various concepts and terminology related to database management.

**LEARNING ACTIVITIES:**

At the end of this block the student will be able to:

1. Describe the nature of database processing and file processing.
2. Describe the limitations of traditional file processing and the difference between flat files and non-flat files.
3. Discuss the advantages and disadvantages of database processing.
4. Identify and describe the functions of a database management system.
5. Describe what a Data Base Management System (DBMS) is.
6. Identify and appreciate the different functions of a Generic DBMS.
7. Identify the different types of DBMS's (Hierarchical versus Relational).
8. Describe the differences between a Hierarchical DBMS and a Relational DBMS.
9. Describe what a Database application is?
10. Define the subsystems of a DBMS. Namely:
  - a) the DBMS engine
  - b) the Definition Tools SubSystem
  - c) the Processing Interface Subsystem
  - d) the Application Development Tools Subsystem
  - e) the Data Administration Subsystem
  - f) the Data Dictionary Subsystem
11. Define and apply the terms schema, sub-schema, logical view, physical view.

**RESOURCES:**

TEXT: Database Management and Design

Chapter 1, 2, 3, 10

**TOPIC 2 DATABASE DESIGN AND DATA MODELLING**

During this block the students will study how to properly design data through the use of data modelling techniques and data normalization.

**LEARNING ACTIVITIES:**

1. Describe the concept of the physical properties of data as it relates to defining objects and domains.
2. Describe the terms:
  - a) relations
  - b) normalization
  - c) modification anomalies
  - d) keys ( and how to apply them in database definition)
  - e) attributes
  - f) functional dependencies
  - g) Uniqueness
3. Demonstrate the differences between the First through Fifth Normal Forms of Data.
4. Describe and appreciate the following Attribute relationships:
  - a) One-to-one
  - b) Many-to-one
  - c) Many-to-many
5. Define compatible and noncompatible unions, differences and intersections of data.
6. Describe and appreciate the process of Object Oriented Data Modeling and use it in Database Design.
7. Describe the role of a DBA, Data Base Administrator in the management of a database.

**RESOURCES:**

TEXT: Database Management and Design

Chapter 4, 7, 9, 11, 12

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**TOPIC 3 RDO and SQL Programming**

During this block the student will learn to navigate in a database environment through the use of data manipulation languages such as RDO and SQL.

**LEARNING ACTIVITIES**

At the end of this block the student will be able to:

1. Describe the elements of a Data Manipulation Language within the RDB environment.
2. Illustrate the significance of SQL as a data manipulation language.
3. Use RDO and SQL to store, modify, and erase data in a Database.
4. Use RDO and SQL to do advanced data manipulation.
5. Use the Common Data Dictionary effectively.

**RESOURCES:**

**TEXT:** Database Management and Design

Chapter 8, 13, 14

**TEXT:** Using SQL

Chapter 1, 2, 3

V. METHOD OF EVALUATION:

The final mark in the course will be arrived at as follows:

Tests and quizzes	60%
Assignments	40%

The tentative breakdown is as follows:

3 Formal Theory Tests	at 15 % each
2 Quizzes	at 5 % each
1 Practical Test	at 5 %
4 Assignments	at 5 % each
2 Assignments	at 10 % each

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

- \* - All assignments must be completed satisfactorily to complete this 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 instructor 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.

**GRADING SCHEME**

1. TESTS

Written tests 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 penalized. 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
I	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 authorized 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.

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. PRIOR LEARNING ASSESSMENT**

This particular course is not a candidate for advanced credit through prior learning assessment at this time.

**VII. REQUIRED STUDENT RESOURCES****TEXTBOOKS:**

"Database Management and Design" BY Hansen & Hansen  
PRENTICE HALL

USING SQL - A McGraw- Hill Book

**VAX/RDB NOTES**

Course notes supplied by the Instructor

**INSTRUCTORS HANDOUTS**

Assigned Reading Material

**VIII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY:**

None are required for this particular course other than those articles assigned and/or provided by the instructor.

**IX. SPECIAL NOTES**

1. Students with special needs are encouraged to discuss required accommodations confidentially with the instructor.
2. Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.
3. The topics and specific objectives will not necessarily be covered in the order shown in this course outline.

**X. COURSE ANALYSIS SHEET (not applicable at this time)**

This particular section is only pertinent to courses that are candidates for prior learning assessment.