

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Outline: DATA BASE MANAGEMENT I
Code No.: EDP215-5
Program: COMPUTER PROGRAMMER
Semester: FOUR
Date: JANUARY, 1994
Previous Outline Dated: JANUARY, 1993
Author: DENNIS OCHOSKI

New: _____

Revision: X

APPROVED:

Dennis Ochoski
Dean, Business & Hospitality

99/01/04
Date

TIME: Five periods per week for one semester

- TEXTS:**
1. Database Processing: Fundamentals - Design - Implementation by David Kroenke, 4th edition
 2. The Guide to SQL Server, by Alope Nath

PURPOSE: This is an introductory course in database management systems and database design.

The course begins with a study of the necessary terminology and concepts to gain an appreciation of databases/database management systems. Database design skills are developed by defining objects using object diagrams, and defining logical relationships among objects using entity-relationship diagrams.

Practical skills are developed through the study and use of Sybase, a relational database management system. A number of case studies will be used to illustrate the analysis, design, and implementation of a database system.

STUDENT EVALUATION:

The student's final grade will consist of the following components:

Tests (3 @ 20%)	60%
Assignments in database design (2 @ 10%)	20%
Project (design & implement a Sybase Database)	20%
	100%

GRADING:

A+	90 - 100%
A	80 - 89%
B	70 - 79%
C	60 - 69%
R	REPEAT - under 60%

- NOTES:**
- 1) There will be NO re-writes in this course due to poor performance.
 - 2) Late assignments will be subject to a 10% deduction per day.

COURSE OBJECTIVES:

1. Learn the role of databases and database applications in organizations.
2. Learn and practice data modelling using the semantic object and entity-relationship models.
3. Learn and practise developing database designs.
4. Understand the impact that database designs have on user requirements and application program structure.
5. Learn the fundamentals of the relational, network, and hierarchial data models.
6. Design and implement a relational database using Sybase and SQL.
7. Understand the functions and responsibilities of data and database administration.

PART A:

The following modules pertain specifically to the theoretical concepts discussed in the course.

Module 1: Introduction to database concepts
(Chapters 1 and 2)

- Objectives:** When this module is completed the student should be able to:
1. distinguish database processing from file processing.
 2. understand the advantages and disadvantages of database processing.
 3. identify and describe the functions of a database management system.
 4. identify the role that various components of a database system play.
 5. define the terms schema, sub-schema, and internal view.

Module 2: Database Development and Modelling
(chapters 3,4, and 5)

Objectives:

When this module is completed the student should be able to:

1. relate this course to the systems analysis and design course
2. understand the perspective for data modelling and design tools and techniques
3. understand the elements of the semantic object model
4. use semantic object diagrams to build a data model
5. compare the semantic object model to object-oriented programming
6. understand the elements of the E-R model
7. apply the E-R model for modelling business situations
8. compare the semantic object model to the E-R model

Module 3: The Relational Model and Normalization
(chapters 6 and 7)

- Objectives:** When this module is completed the student should be able to:
1. explain relational terminology
 2. understand and apply the rules for composing relations
 3. understand how trees, simple networks and complex networks are represented in the relational model
 4. understand the concept of normalization and apply normal forms to database design in the relational model
 5. transform semantaic object models into relational designs
 6. transform E-R models into relational designs

Module 4: Physical Structures and the Hierarchial and CODASYL Models
(chapters 12 and 13 and Appendix B)

- Objectives:** When this module is completed the student should be able to:
1. understand physical structures such as sequential lists, linked lists, and inverted lists
 2. understand how trees, simple networks and complex networks can be represented using linked lists and inverted lists
 3. understand how secondary unique and non-unique keys can be represented using linked lists and inverted lists
 4. understand the nature of database processing using the CODASYL model
 5. represent trees, simple networks, and complex networks with the CODASYL model
 6. show how trees, simple networks, and complex networks are represented in the hierarchical model

Module 5: Data/Database Administration
(chapter 14)

- Objectives:** When this module is completed the student should be able to:
1. understand the importance of data and database administration.
 2. define the DA/DBA's role in the management of data activity.
 3. define DA/DBA personnel and placement within an organization.

PART 'B': The following topics pertain specifically to the Sybase Database Management System (a relational system) and to the SQL fourth generation language. These will be discussed concurrently with the theoretical concepts in Part 'A'.

MODULE 1: This module introduces the basic concepts related to data retrieval.

- Objectives:** Upon completion of this module, the student should be able to:
- 1) list the tables that are in the demonstration database
 - 2) query the database retrieving column and row data
 - 3) query the database using conditions to restrict data retrieved
 - 4) use boolean expressions in the condition of a query
 - 5) use an editor to change the SQL buffer
 - 6) rename column headings in the retrieved data
 - 7) use the numeric functions in data retrieval
 - 8) define the meaning of a null value
 - 9) sort the data output

MODULE 2: This module introduces the concepts of organizing data and summarizing results.

Objectives: Upon completion of this module, the student should be able to:

- 1) use aggregate functions
- 2) organize data into groups (GROUP BY)
- 3) set conditions on groups (HAVING)

MODULE 3: This module introduces the concepts of joins and subqueries.

Objectives: Upon completion of this module, the student should be able to perform:

- 1) a join based on an equality
- 2) a join with other conditions included
- 3) a join which joins a table to itself (self-join)
- 4) a join that includes non-matching rows (outer join)
- 5) a join of more than two tables
- 6) a query with multiple levels
- 7) a sub-query with comparison operators
- 8) a sub-query for an existence test

MODULE 4: This module introduces the concept of data definition and manipulation.

Objectives: Upon completion of this module, the student should be able to:

- 1) create a Sybase database
- 2) create tables for a database
- 3) create rules^s, defaults, datatypes, and indexes
- 4) insert data into a table
- 5) update data in a table
- 6) delete data from a table
- 7) describe ^{and} ~~the~~ use stored procedures