

COURSE OUTLINE

Database Management Systems

Course Title

IT 120

Dept. & Course Number

I. COURSE DESCRIPTION:

This course introduces the file management and data structures involved in the design, implementation, and use of a database management system. Topics include file organization, data structures, program development, and security of data in creating, maintaining, and accessing a database.

II. SEMESTER CREDIT: 3

III. CONTACT HOURS PER WEEK: 3 0 3
Lecture Lab Total

IV. PREREQUISITES: IT 105, IT 110

V. STUDENT LEARNING OUTCOMES:

At the end of the course, students will be able, with 65% accuracy, to:

1. Distinguish between data and information, explain what a database is, describe different types of databases, and explain why they are valuable assets for decision-making.
2. Discuss how the major data models evolved and their advantages and disadvantages, and describe how data models can be classified by level of abstraction.
3. Describe the relational database model's basic components and how data redundancy is handled in this database model, and explain why indexing is important in a database.

VI. COURSE CONTENT:

- A. Data Base Systems
 1. Data vs. Information
 2. Introducing the Database and the DBMS
 3. Why Database Design Is Important
 4. The Historical Roots of the Database: Files and File Systems
 5. Problems with File System Data Management
 6. Database Systems
- B. Data Models
 1. The Importance of Data Models
 2. Data Model Basic Building Blocks
 3. Business Rules
 4. The Evolution of Data Models
 5. Degrees of Data Abstraction
- C. The Relational Database Model
 1. A Logical View of Data
 2. Keys
 3. Integrity Rules Revisited
 4. Relational Database Operators
 5. The Data Dictionary and the System Catalog
 6. Relationship Within the Relational Database
 7. Data Redundancy Revisited
 8. Indexes

4. Explain how relationships between entities are defined and how such relationships are incorporated into the database design process.

5. Explain what normalization is and what role it plays in the database design process and identify the various normal forms used in the database design process.

6. Identify the basic commands and functions of SQL, describe how to use SQL for data administration and manipulation, and explain how to use SQL to query a database to extract useful information.

7. Describe the Systems Development Life Cycle (SDLC) and the Database Life Cycle (DBLC) and explain how to conduct evaluation and revision within the SDLC and DBLC frameworks and identify types of database design strategies that exist today.

D. Entity Relationship (ER) Modeling

1. The Entity Relationship (ER) Model
2. A Comparison of ER Modeling Symbols
3. Developing an ER Diagram
4. The Challenge of Database Design: Conflicting Goals

E. Normalization of Database Tables

1. Database Tables and Normalization
2. Normalization and Database Design
3. Higher-Level Normal Forms
4. Denormalization

F. Introduction to Structured Query Language

1. Introduction to SQL
2. Data Definition Commands
3. Data Manipulation Commands
4. SELECT Queries
5. Advanced Data Definition Commands
6. Advanced SELECT Queries
7. Virtual Tables: Creating a View
8. Joining Database Tables
9. Converting an ER Model into a Database Structure

G. Database Design

1. Changing Data into Information
2. The Information System
3. The System Development Life Cycle (SDLC)
4. The Database Life Cycle (DBLC)
5. A Special Note About Database Design Strategies
6. Centralized vs. Decentralized Design

8. Justify that the introduction of a DBMS has an important technological, managerial, and cultural organizational consequences and describe several database administration tools and various administration strategies.

H. Database Administration

1. Data as a Corporate Asset
2. The Need for and Role of Databases in an Organization
3. Introduction of a Databases Administration Function
4. The Database Environment's Human Component
5. Database Administration Strategy
6. The DBA at Work: Using Oracle for Database Administration

VII. MATERIALS AND EQUIPMENT

- A. Student computers with Windows OS, Microsoft Word and Microsoft Access.
- B. Projector
- C. Routine classroom materials
- D. 1 USB storage device (at least 1GB)—student-furnished

VIII. TEXT AND REFERENCES

- A. Required Text:

Rob, Peter and Carlos Coronel. Database Systems: Design, Implementation, & Management. Boston, MA: Thomson Publishing Co.

- B. Supplementary References: handouts

IX. METHOD OF INSTRUCTION

- A. Lecture
- B. Hands on Experience
- C. Demonstration
- D. Questions and Answers (Discussion)

X. METHOD OF EVALUATION

A. Description.....	Points
Assignments	30%
Class Projects/Case Studies	20%
Chapter Tests.....	30%
Midterm.....	10%
Final Exam.....	10%
	<u>100%</u>

B. Transmutation of percent to letter	
90 - 100	A
80 - 89	B
70 - 79	C
65 - 69	D
0 - 64	F

Palau Community College
IT 120-Database Management Systems
Course Learning Outcomes

During the course experience, the **Course Learning Outcomes** (CLOs) will be assessed through the use of signature assignments. A rating scale will be used to determine the students' proficiency level of each CLO using specifically aligned assignments. The numerical ratings of 4, 3, 2 and 1 are not intended to represent the traditional school grading system of A, B, C, D and F. The descriptions associated with each of the numbers focus on the level of student performance for each of the course learning outcomes listed below.

Rating Scale: 4-----Exceeds Expectations
 3-----Meets Expectations
 2-----Developing
 1-----Below Expectations

CLO #1:

Numerical Value	Identify different types of databases and describe their characteristics.
4	Perform all of the following tasks accurately and completely: <ul style="list-style-type: none"> • Identify single-user and multiuser databases and describe their characteristics. • Identify workgroup and enterprise databases and describe their characteristics. • Identify centralized and distributed databases and describe their characteristics. • Identify transactional/production and data ware-house databases and describe their characteristics.
3	Perform the tasks mentioned above with mixed quality, but most are adequate and complete.
2	Perform the tasks mentioned above with mixed quality, but most are inadequate or incomplete.
1	Perform the tasks mentioned above inaccurately or incompletely.

CLO #2:

Numerical Value	Identify and label different areas or sections of a database.
4	Perform all of the following tasks accurately and completely: <ul style="list-style-type: none"> • Identify database entities • Identify entity attributes • Identify and determine field data types and properties • Identify and determine entity relationship
3	Perform the tasks mentioned above with mixed quality, but most are adequate and complete.
2	Perform the tasks mentioned above with mixed quality, but most are inadequate or incomplete.
1	Perform the tasks mentioned above inaccurately or incompletely.

CLO #3:

Numerical Value	Troubleshoot and correct database problems.
4	Perform all of the following tasks accurately and completely: <ul style="list-style-type: none"> • Identify and correct structural problems. • Identify and correct data type problems. • Identify and correct relationship problems. • Identify and correct data problems.
3	Perform the tasks mentioned above with mixed quality, but most are adequate and complete.
2	Perform the tasks mentioned above with mixed quality, but most are inadequate or incomplete.
1	Perform the tasks mentioned above inaccurately or incompletely.

CLO #4:

Numerical Value	Plan, design, and create a relational database.
4	Perform all of the following tasks accurately and completely: <ul style="list-style-type: none">• Identify subject and determine essential database entities/tables.• Identify all necessary fields for each entity including data type and other characteristics.• Sketch a design of your database on paper and determine relationships between the entities.• Create a relational database computer based on your sketch.
3	Perform the tasks mentioned above with mixed quality, but most are adequate and complete.
2	Perform the tasks mentioned above with mixed quality, but most are inadequate or incomplete.
1	Perform the tasks mentioned above inaccurately or incompletely.