BUTTE COLLEGE
COURSE OUTLINE

I. **CATALOG DESCRIPTION**

BUS 18 - Database Design **4 Unit(s)**

Prerequisite(s): NONE
Recommended Prep: Reading Level IV; English Level IV; Math Level III
Transfer Status: CSU
51 hours Lecture
51 hours Lab

This course is a study of fundamental database design principles and techniques, including data modeling with Entity-Relationship Diagrams (ERD) and the normalization process. Topics include the relational data model, managing data using Structured Query Language (SQL), database management system (DBMS) architecture and operation, and database security mechanisms. Students will apply core concepts and techniques to practical business scenarios.

II. **OBJECTIVES**

Upon successful completion of this course, the student will be able to:

A. Identify and describe the characteristics of the relational data model in the context of modern relational DBMS.
B. Design a database using ERD and apply the normalization process to ensure proper organization of data.
C. Use SQL to manage data in a relational DBMS.
D. Analyze the architecture and functionality of a modern relational DBMS.
E. Analyze and compare the capabilities of various commercial DBMS products for large- and small-scale databases.
F. Identify and describe the responsibilities of a database administrator, including system security, database integrity, system maintenance and operation, and performance evaluation.

III. **COURSE CONTENT**

A. **Unit Titles/Suggested Time Schedule**

Lecture

Topics	Hours
1. Introduction to DBMS	3.00
2. Relational Data Model (Terminology, Characteristics, Operations)	3.00
3. Database Design: Entity-Relationship Approach	6.00
4. Normalization Procedures	3.00
5. Logical Schema (Entities, Relationships, Attributes, Keys, Implementation of Relationships)	6.00
6. SQL	12.00
7. DBMS Architecture and Operation	3.00
8. Database Project Implementation	9.00
9. Relational Operations; Database Views	3.00
10. Database Administration Issues; Responsibilities of the Datbase Administrator (DBA)	3.00
Total Hours	51.00

Lab

Topics	Hours
1. Relational Data Model (Terminology, Characteristics, Operations)	3.00
2. Database Design: Entity-Relationship Approach	3.00
3. Normalization Procedures	3.00
4. Logical Schema (Entities, Relationships, Attributes, Keys, Implementation of Relationships)	3.00
5. SQL	18.00
6. Design Standards and Flaws	3.00
7. Database Project Implementation	15.00
8. Relational Operations; Database Views	3.00
Total Hours	51.00

IV. METHODS OF INSTRUCTION

A. Lecture
B. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
C. Discussion
D. Demonstrations
E. Reading Assignments
F. Multimedia Presentations

V. METHODS OF EVALUATION

A. Exams/Tests
B. Quizzes
C. Research Projects
D. Class participation
E. Lab Projects
F. Written Assignments

VI. EXAMPLES OF ASSIGNMENTS

A. Reading Assignments
    1. Read the "Database Design Guidelines" section of your book and come to class prepared to discuss the guidelines pertaining to primary keys and attributes.
    2. Read the "Quick Start" section of the "SQL*Plus User's Guide and Reference," and be prepared to demonstrate for the instructor your ability to launch the SQL*Plus command-line client and connect to a specific database.
B. Writing Assignments
    1. List and briefly describe each of the six fundamental rules for building a relational database. Print and submit your work to the instructor at the next class meeting.
    2. Write a short (1-2 pages) paper to present a comprehensive description of the execution of an SQL command. Your description should include the client, server, and network activities associated with the execution of an SQL command.
C. Out-of-Class Assignments
    1. Do research on the Internet to identify a minimum of three applications that can be used to create Entity-Relationship Diagrams. Submit a brief analysis of the three applications you select, including the vendor, advantages, disadvantages, and pricing/licensing.

2. Create and submit to the instructor an ERD and attribute listing (please identify all primary keys) for the hypothetical retail store database design problem provided in class by the instructor.

VII. RECOMMENDED MATERIALS OF INSTRUCTION

Textbooks:

A. Lees, S., Mensching, J., & Tidwell, A.. Database Management: The Foundation of Management Information Systems. 19th Edition. Knowledge Transfer Systems, 2011.

Materials Other Than Textbooks:

A. Online reference materials as assigned by the instructor.

Created/Revised by: Donna Weaver
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