Las Positas College
3000 Campus Hill Drive
Livermore, CA 94551-7650
(925) 424-1000
(925) 443-0742 (Fax)

Course Outline for CIS 9001

DATABASE DESIGN METHODOLOGY

Effective: Spring 2018

I. CATALOG DESCRIPTION:
CIS 9001 — DATABASE DESIGN METHODOLOGY — 3.00 units

This course provides students with a vendor-neutral introduction to and an overview of database systems; including database design, conceptual, logical and physical data modeling, Entity Relationship models. This course includes sections on relational databases, Structured Query Language (SQL) and optimizing databases through normalization. You will apply your knowledge with hands-on labs designed to apply the intricacies of database design methodology.

2.50 Units Lecture 0.50 Units Lab

Strongly Recommended
CIS 57 - Database Concepts

Grading Methods:
Letter or P/NP

Discipline:
- Computer Information Systems

	MIN
Lecture Hours:	45.00
Lab Hours:	27.00
Total Hours:	72.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering this course, it is strongly recommended that the student should be able to:

A. CIS57
1. Design, create, and manipulate the database objects tables, queries, forms and reports
2. Create forms, reports, and queries using multiple tables
3. Evaluate client needs and design an appropriate database

IV. MEASURABLE OBJECTIVES:

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

A. Describe basic database types and management systems
B. Identify relational data modeling schemas, characteristics and manipulation
C. Identify the activities in the conceptual design phase of a database
D. Apply normalization techniques and processes
E. Describe logical database design steps and practices
F. Interpret logical data models into a physical data model that can be implemented by a particular database management system (DBMS)
G. Eavluate SQL commands and syntax
H. Create statements using Data Definition Language (DDL)

V. CONTENT:
A. Introduction to Databases
1. Introduction to Databases
2. What Is a Database?
3. File-Based Databases
4. The Evolution of Databases
5. Relational Databases and Database
6. Management Systems (DBMSs)
7. Origins of Relational Databases
B. Relational Database Fundamentals
1. Introduction to Relational Databases
2. Multitier Database Architecture
3. Relational Model Terminology

4. Using Tables to Represent Data
5. Characteristics of Relations
6. Data Models
7. Entities and Data Relationships
8. Relational Integrity
9. Database Languages
10. Data Dictionaries

C. Database Planning
1. Introduction to Database Planning
2. Database Design Life Cycle
3. Database Requirements Document
4. ProAudio Case Study
5. Selecting a DBMS
6. Selecting an Application Interface

D. Overview of Database Design Methodology
1. Introduction to Database Design Methodogy
2. Effects of Poor Database Design Practices
3. Database Design Phases
4. Conceptual Database Design
5. Entity-Relationship (ER) Models

E. Normalization
1. Introduction to Normalization
2. What Is Normalization?
3. Normal Forms
4. First Normal Form
5. Second Normal Form
6. Third Normal Form
7. Boyce-Codd Normal Form (BCNF)

F. Logical Database Design
1. Introduction to Logical Database Design
2. Logical Database Design
3. Creating a Logical Data Model
4. Using a Database Definition Language
5. Validating the Logical Data Model
6. Defining Integrity Constraints
7. Creating an Enterprise Data Model

G. Physical Database Design
1. Introduction to Physical Database Design
2. Physical Database Design
3. MySQL Query Browser
4. Creating Enterprise Constraints
5. Using Secondary Indexes
6. Denormalization
7. Creating User Views
8. Designing Database Access Rules

H. Structured Query Language
1. Introduction to Structured Query Language
2. SQL Basics
3. Data Definition Language
4. Data Manipulation Language
5. Retrieving Data from Relations
6. Data Control Language
7. Relational Algebra
8. Introduction to Relational Algebra
9. Defining Relational Algebra
10. Selection
11. Projection
12. Cartesian Product
13. Union
14. Difference
15. Intersection
16. Joins

VI. METHODS OF INSTRUCTION:

A. Lecture and classroom discussion
B. Computer demonstrations with overhead display panel
C. Discussion boards
D. Lab experience: hands-on lab assignments and database creation and manipulation
E. PowerPoint presentations
F. Read text and other supplemental sources (example, Internet sites)

VII. TYPICAL ASSIGNMENTS:

A. Research the U.S. Department of Labor Bureau of Labor Statistics Occupational Outlook Handbook database job. Write a short summary of your finding, share with discussion board
B. Given the following business requirements develop an inital conceptual database model
C. Develop an Entitity Relational Diagram from the info provided
D. Hands-on lab assignment, write the SQL program to: to Display for each employee the employee number, last name, salary, and salary increased by 15% and expressed as a whole number. Label the column New Salary

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Projects
4. Lab Activities

B. **Frequency**

1. Chapter quizzes (theory)

2. Mid-term examinations (theory)
3. Final Exam (theory)
4. 1-2 projects (individual and/or group)
5. Weekly hands-on lab assignments to reinforce and demonstrate mastery of the various tools

IX. TYPICAL TEXTS:

1. Certification Partners. *Database Design Specialist: Academic Student Guide*. v2.0 ed., Certification Partners, 2016.
2. Cornonel, Carlos. *Database Systems: Design, Implementation, and Management.* 11th ed., Cengage, 2015.
3. Oracle Corporation. *Database Foundations.* 1st ed., Oracle, 2016.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Access to the World Wide Web with any major Web browser