

Principles of Database Design

Audience	This course is for anyone who is developing a database application and has little or no previous experience in doing data analysis and design. No previous knowledge of data analysis and design is needed. The course is not for professional data analysts.
Description	<p>75% of all database problems are the result of bad database design rather than software inefficiencies. This course addresses that problem and teaches design techniques, <i>regardless of the type of database software used</i>. It uses a combination of lecture and group exercises to familiarize students with how to set up a database for maximum efficiency and effectiveness. This is not a hands-on computer class and database software is not discussed. Identifying entities (the things about which to store data in a database), the data to store in the database, and relationships among the entities are the major concepts covered. Using this information, the structure of the database is identified. An understanding of the best database design is necessary to create a flexible, stable database.</p> <p>A manual that documents the concepts and rules for data analysis is provided. The manual also contains information about the group exercises.</p>
Objectives	<p>After completing the class, students should be able to:</p> <ul style="list-style-type: none">■ discuss the differences between data and information,■ identify the objects about which information should be kept,■ specify the information to be recorded in the database and associate it with the correct objects,■ identify the relationships in the information,■ translate the data analysis into an effective relational database design,■ appreciate the importance of data analysis to successful database application implementations.
Length	1 day
Beyond this Level	When you have successfully completed this class, the next class you should consider is a Access Level 1. Students will learn to use Access efficiently and productively. They will view, edit, and print data in the tabular "datasheet" format. They will be shown how to sort and select specific rows and columns to view and design and create tables. Students will gain techniques that master database processes.



I. Data vs. Information

- A. Data
- B. Information
- C. Information Synergy

II. Database Management

- A. Types of Databases
- B. Database Usage by Type
- C. Software to Manage the Database
- D. Relational Database Model

III. Data vs. Process Analysis

- A. Data Analysis Definition
- B. Data Analysis
- C. Process Analysis
- D. Role of Data Analysis and Process Analysis in Database Design

IV. Entity Analysis

- A. Entity Type
- B. Entity Type Identification Criteria
- C. Entity Type Data Diagram

V. Attribute Analysis

- A. Attribute Types
- B. Attribute Type Identification Criteria
- C. Attribute Type Data Diagram Notation
- D. Identifiers - Primary Keys

VI. Relationship Analysis

- A. Relationship Type
- B. Relationship Type Identification Criteria
- C. Determining Kind of Relationship Type

- D. One-to-One Relationship Types
- E. One-to-Many Relationship Types
- F. Many-to-Many Relationships
- G. Recursive Relationships
- H. Relationship Type Data Diagram Notation

VII. Recording Transactions and History

- A. Transaction, & History Requirements Analysis Definition
- B. Transaction Tables
- C. History Tables

VIII. Relational Database Design

- A. Entity Relationship Diagrams
- B. Translating Analysis Results to Database Design
- C. Naming Considerations
- D. Space Considerations
- E. Performance Considerations
- F. Data Independence