

Web Development Series

Database Design Specialist



The *Database Design Specialist* course (formerly titled *Database Design Methodology*) teaches students how to plan and design relational databases. You will learn about the theory behind relational databases, relational database nomenclature, and relational algebra. The course includes sections on Structured Query Language (SQL) and optimizing databases through normalization. You will apply your knowledge with hands-on labs designed to teach the intricacies of database design methodology.

Topics

Introduction to Databases

- Introduction to Databases
- What Is a Database?
- File-Based Databases
- The Evolution of Databases
- Relational Databases and Database Management Systems (DBMSs)
- Origins of Relational Databases

Relational Database

Fundamentals

- Introduction to Relational Databases
- Multitier Database Architecture
- Relational Model Terminology
- Using Tables to Represent Data
- Characteristics of Relations
- Data Models
- Entities and Data Relationships
- Relational Integrity
- Database Languages
- Data Dictionaries

Database Planning

- Introduction to Database Planning
- Database Design Life Cycle
- Database Requirements Document
- ProAudio Case Study
- Selecting a DBMS
- Selecting an Application Interface

Overview of Database Design Methodology

- Introduction to Database Design Methodology
- Effects of Poor Database Design Practices
- Database Design Phases
- Conceptual Database Design
- Entity-Relationship (ER) Models

Normalization

- Introduction to Normalization
- What Is Normalization?
- Normal Forms
- First Normal Form
- Second Normal Form
- Third Normal Form
- Boyce-Codd Normal Form (BCNF)

Logical Database Design

- Introduction to Logical Database Design
- Logical Database Design
- Creating a Logical Data Model
- Using a Database Definition Language
- Validating the Logical Data Model
- Defining Integrity Constraints
- Creating an Enterprise Data Model

Physical Database Design

- Introduction to Physical Database Design
- Physical Database Design
- MySQL Query Browser
- Creating Enterprise Constraints
- Using Secondary Indexes
- Denormalization
- Creating User Views
- Designing Database Access Rules

Structured Query Language

- Introduction to Structured Query Language
- SQL Basics
- Data Definition Language
- Data Manipulation Language
- Retrieving Data from Relations
- Data Control Language

Relational Algebra

- Introduction to Relational Algebra
- Defining Relational Algebra
- Selection
- Projection
- Cartesian Product
- Union
- Difference
- Intersection
- Joins

Transactions and Database Security

- Introduction to Database Transactions and Security
- Transactions
- Concurrency Control
- Database Security

Target Audience

The *CIW Database Design Specialist* course is for individuals who plan to pursue product-focused database specialization using products that include DB2, Oracle Database 11g, SQL and MySQL.

These database skills can help you begin or grow a career in advanced database design and development for:

- IT managers/directors
- Application developers
- Web development professionals
- Software programmers
- Enterprise developers
- Database developers
- Database administrators

Job Responsibilities

Use database technology to store, update and retrieve mission-critical information; implement and maintain database data using relational database management software; and create Web content.

Prerequisites

It is recommended that students have a basic knowledge of the purpose and function of a database. Also, students should be familiar with an operating system such as Microsoft Windows before taking this course. The *Database Design Specialist* courseware does not provide entry-level computer literacy.