

CIW Database Specialist Series – Course 1:

Database Design Methodology (June 2002)

Database Design and Methodology is a 18-hour course that teaches students how to plan and design relational databases. Students will learn about the theory behind relational databases, relational database nomenclature, and relational algebra. The course includes sections on the Structured Query Language (SQL) and optimizing databases through normalization. Students will apply their knowledge with hands-on exercises 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
- 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
- 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 Models

Normalization

- Introduction to Normalization
- What Is Normalization?
- Normal Forms

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
- 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

Application developers, programmers, enterprise developers, Web developers, and database developers.

Job Responsibilities

Design, implement, and maintain database schemas; design and develop database client applications and components; and perform database administration, security and maintenance.

Prerequisites

Students must have with a minimum of two years of professional experience with databases, a programming language and web-related programming projects.

Duration

18 hours