

SA02 - Data Modeling and Relational Database Design

DESCRIPTION

This relational database design and modeling class develops relational database design skills and techniques. Practical methodologies such as E-R diagrams and normalization forms are emphasized. Attention is placed on designing for data integrity and efficiency at the same time.

During hands on lab sessions students are required to design multiple database models from business requirements and specifications. Students will experience the necessity of proper design methods and gain an in depth understanding of the link between design, creation, and utilization. The impact of alternative designs on maintainability and database performance is emphasized.

Students will use the methods learned to identify and define business information requirements, create entity-relationship models, and transform the requirements into an initial database design.

AUDIENCE

- Systems Analysts
- IT Professionals
- Project Managers
- Team Leaders

DURATION

- The duration of this course is: **2 days (14 hours)**

COURSE OBJECTIVES

- Understand the issues involved in specifying foreign keys and indexes
- Recognize when to generate artificial keys
- Analyze user information requirements
- Maximize application maintainability by applying the principles of normalization
- Improve performance through de-normalization
- Communicate business information requirements with an entity relationship model
- Model exclusive and recursive relationships
- Understand the principles of transferability and referential integrity

COURSE OUTLINE

Module 1: Relational Database Methodology

- Relational Database Fundamentals
- Database Development Methodology Overview

Module 2: Building a Logical Database Model

- Identifying Entities and Attributes
- Isolating Keys
- Relationships between Entities (One-to-One, One-to-Many, Many-to-Many)
- Creating Entity-Relationship Diagrams
- Complex Modeling Issues
- Exclusive and Recursive Relationships
- Super-type / Subtype Entities
- Normalization as a Design Technique

Module 3: Transforming to Physical Design

- Migrating Entities to Tables
- Selecting Primary Keys
- Defining Columns
- Enforcing Relationships with Foreign Keys
- Implementing Exclusive and Recursive Relationships
- Implementing Super-types / Subtypes
- Enforcing Business Rules
- Transactional vs. Query Tables

Module 4: Designing for Performance

- Indexing
- De-normalization
- Row Column Layout
- Table Partitioning
- Addressing Data Contention
- Storage Considerations

Module 5: More Designing Issues

- Designing for Security: Users and Roles
- Selecting Database or Database Management System Software
- Operating Environment Considerations
- Referential Integrity Enforcement and Implications