



Course 260: Designing Oracle Databases

(4 days)

Course Description...

Oracle and other relational database management systems (RDBMS) are easy to use. Tables and other schema objects can be created and used with a few simple commands. Unfortunately, this usually leads to poor data architecture resulting in poor performance, data integrity problems, in addition to higher software development and maintenance costs.

This course introduces relational theory, which is the foundation for the design of an Oracle Database. Students learn the principles of top-down designing and also to verify the design with bottom-up Normalization techniques. Full team environments lead to discussions of how to best implement the requirements and satisfy all business rules. The course also discusses Oracle services and design implementations using structured walk-throughs at checkpoints to verify the work.

Learning Objectives...

- Understand relational theory
- Capture design requirements with top-down techniques
- Verify the Entity Relationship Diagram via Normalization
- Gain an appreciation of Oracle Server Architecture
- Cast the Logi0063al/Physical Design into the database
- Understand what SQL is and how to define the schema
- Learn how business rules are implemented, both declaratively and with code
- Review the services that the Oracle Database provides for applications

Who should attend...

This course is suited for database designers, application developers, and high end users who need to use database services. It is a foundational course for those becoming database administrators (DBAs) or data architects.

Prerequisites...

No specific prerequisites are assumed.



Course Outline...

A Lecture-Demo Course

Introduction and Overview

Course Objectives

Unit 1: Data Models: Ways of Storing Information

- Database Models
 - File Systems, Hierarchical and Network Databases
- Structure
- The Implementation of the Relational Model: The Oracle RDBMS

Unit 2: Logical Design: The Top-Down Process

- Definition – Logical Design
- Entity-Relationship Diagrams
 - The Four Elements
- Special Modeling Forms
 - Recursive Relationships
 - Super and Sub Type

Unit 3: Normalization: The Bottom-Up Process

- Definition
- Why We Normalize
 - Transactional Systems
- A Normalization Methodology: Codd's Rules
 - 1NF, 2NF, 3NF and Beyond

Unit 4: Overview of the Oracle Database

- Architecture Overview
 - Disk, Memory, and Processes
- Database Accounts
 - Definitions
 - A "database" within the Database
- The Basics of SQL
 - Definitions
 - Forms of Black Box Testing
 - Advantages and Disadvantages
 - History
 - Classifications
- Defining the Schema
 - Data Definition Language (DDL)

Unit 5: Turning Design into an Oracle Database

- Turn the Logical ERD into a Physical Model
 - Resolve Design Issues



- Turn the Physical Model into an Oracle Schema
 - By Hand
 - CASE Tools: Oracle Designer

Unit 6: Integrity

- Business Rules
- Declarative Constraints
 - Mandatory Columns, Primary, Unique and Foreign Keys, Check Constraints
 - Non-Declarative Ways of Implementing Business Rules
 - Options: Server- or Client-side
 - Triggers

Unit 7: Finishing the Design: Specifying Oracle Database Services

- Transaction Processing
 - Definition
 - Required Services
- Security
 - Database Authentication
 - Account Authorization
- Durability
 - Recovery
- Performance
 - SQL Statement Processing
 - Server Tuning

Unit 8: The Oracle Database Design Checklist

Summary