



Course 280: Relational Database Principles for Oracle DBAs

Course Description...

Historically, Database Administrators (DBAs) have been responsible for the design of the database. In many organizations, this function has moved to the application developers or even the user groups who may not recognize the performance, integrity, and storage impacts of their design. Oracle and other relation database management systems (RDBMS) profess ease of use, with a few simple commands, tables and other schema objects can, on the fly, be created and used. The DBAs, with their knowledge of the internals of Oracle, can improve the project handed to them, but the overall performance is limited by the data architecture.

This course lays the foundation for designing an Oracle Database: relational theory using the principles of top-down designing and learning 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 implementation 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
- Review Oracle Server Architecture
- Cast the Logical/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 Oracle Database provides for applications
- Investigate the authority of Oracle's Supplied Packages

Who should attend...

This is an introductory course for database administrators (DBAs), particularly those who are responsible for design or review of design. This information is vital for DBAs who are tasked with performance tuning and those who work closely in supporting the application developers.

Prerequisites...

No specific prerequisites are assumed, although a basic understanding of Oracle Architecture is a plus.



Course Outline

A Lecture-Demo Course

Introduction and Overview

Course Objectives

Unit 1: Relational Theory

- Database models
 - File systems, hierarchical and network databases
- Structure

Unit 2: Top-Down Data Modeling: The ERD

- Definition
- Entity-Relationship Diagrams
 - The four elements
- Special modeling forms
 - Recursive relationships
 - Super and sub type

Unit 3: Bottom-Up Data Analysis: Normalization

- 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
- 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

- Definition
 - 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: Oracle Database Services

- Transaction processing
 - Definition
 - Required services
- Security
 - Database authentication
 - Account authorization
- Durability
 - Recovery
- Performance
 - SQL statement processing
 - Server tuning

Unit 8: The Data Dictionary

- The DBA's application schema
 - Reading via SQL select
 - Maintaining via SQL DDL Commands
- Standard accounts
- Static views
- Dynamic performance views

Unit 9: Course Summary

Summary