

Relational Database Design and Data Integrity Course

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Overview

The Relational Database Design and Data Integrity Course is a one-week intermediate course for database developers, analysts, engineers, and solution designers who leave with a Validated Relational Database Design Pack. It connects relational database design, requirements analysis, entity relationship modeling, database normalization, data integrity controls, SQL data definition, indexing, transactions, performance decisions, and review. Participants turn business rules into traceable structures for operational and analytical systems. Agile Leaders Training Center delivers this course on relational database design and data integrity.

Who Should Attend

- Teams responsible for translating business information needs into database structures
- Professionals responsible for analyzing data entities, attributes, and relationships
- Developers responsible for implementing relational schemas in application environments
- Engineering teams responsible for dependable data pipelines and storage structures
- Solution design functions responsible for reviewing technical data architecture decisions

The course assumes participants work with structured data requirements or database implementations and leaves out introductory programming, advanced query optimization, and database administration.

Departments and Industries

The course supports database design decisions across operational and analytical environments.

- Software engineering and application development
- Data engineering and business intelligence
- Financial services and transaction operations
- Healthcare information and service administration
- Retail, logistics, and inventory systems

Learning Objectives

By the end of this course, participants will be able to:

- Analyze information requirements and business rules
- Build conceptual and logical entity relationship models
- Apply keys, constraints, and database normalization
- Use SQL data definition to implement relational schemas
- Evaluate indexes, transactions, and performance tradeoffs
- Create a Validated Relational Database Design Pack

Course Agenda

Day 1: Requirements and Conceptual Models

- Information Requirement and Business Rule Register
- Entity Identification and Attribute Classification Method
- Entity Relationship Diagram Notation
- Cardinality and Optionality Decision Matrix
- Conceptual Data Model Review Checklist

Day 2: Keys Constraints and Normalization

- Candidate Key and Primary Key Selection Matrix
- Foreign Key and Referential Integrity Map
- Domain Check and Uniqueness Constraint Catalogue
- Functional Dependency Analysis Method
- First Second and Third Normal Form Assessment

Day 3: Logical and Physical Schema Design

- Logical-to-Physical Model Mapping Table
- Table Column and Data Type Specification
- SQL Data Definition Language Script
- Junction Table and Relationship Resolution Pattern
- Schema Naming and Documentation Standard

Day 4: Integrity Performance and Review

- Transaction Boundary and Atomicity Map
- Isolation and Concurrency Risk Matrix
- Index Candidate and Selectivity Assessment
- Normalization and Denormalization Tradeoff Analysis
- Database Design Quality Review Scorecard

Day 5: Relational Design Practice

- Suggested Exercise: Requirements-to-Entity Analysis
- Suggested Exercise: Keys Constraints and Normalization Review
- Suggested Exercise: SQL Schema Definition Challenge
- Suggested Exercise: Index and Transaction Decision Review
- Capstone Exercise: Validated Relational Database Design Pack

Practical Exercises

The course includes suggested activities for converting business requirements into defensible database structures.

- Suggested activity: model customer and transaction requirements for a financial service.
- Suggested activity: normalize an inventory schema and document integrity constraints.
- Suggested activity: assess indexes and transaction boundaries for an operational workload.
- Suggested activity: present a Validated Relational Database Design Pack for peer review.

FAQs

Who suits the Relational Database Design and Data Integrity Course?

Database developers, analysts, software developers, data engineers, systems analysts, and solution designers suit the course; it assumes experience with structured data requirements or database implementations.

How does relational database design differ from a SQL query course?

Relational database design defines entities, relationships, keys, constraints, and schemas, while a SQL query course primarily develops skills for retrieving and manipulating data from an existing structure.

Why is database normalization important for data integrity?

Database normalization separates facts according to their dependencies, reducing update anomalies and making keys, relationships, and integrity rules easier to apply consistently.

How do indexes affect relational database performance?

Indexes can reduce data access work for selected operations, but they consume storage and add maintenance work, so their value depends on workload, selectivity, and transaction patterns.

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What belongs in a validated relational database design?

A validated relational database design includes requirements, entity relationships, keys, constraints, normalized schemas, physical definitions, transaction assumptions, index decisions, documentation, and recorded review findings.

Conclusion

Participants leave with a Validated Relational Database Design Pack linking requirements, models, integrity rules, SQL definitions, indexes, and review evidence. The work product improves traceability from business rules to implemented structures. It gives technical teams a reusable basis for evaluating schema quality and coordinating implementation decisions.

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