

Module One: Data Modeling Concepts

- The Data Modeling Life Cycle
 - Where Data Modeling Begins and Ends
 - Between Business Needs and Implemented Data
- Kinds of Data Systems
 - Business Uses of Data
- Data Taxonomies
 - Data Properties
 - Data Characteristics
- Data Modeling Framework for BI
 - Where and What to Model

Module Two: Business Data Models

- Business Context
 - Business Drivers, Goals, and Strategies
 - Business Information Needs
 - Business Domains
 - Business Subjects
- Business Data Model Development
 - Top-Down – Incremental and Iterative
- Gathering Business Questions
 - The Modeling Process
 - Working with the Business
 - An Example
- Analyzing Business Questions
 - The Modeling Process
 - Mapping Facts and Qualifiers – Finding the Facts
 - Mapping Facts and Qualifiers – Fact/Qualifier Associations
 - An Example
- Fact Analysis and Refinement
 - Removing Redundancy
 - An Example
- Qualifier Analysis and Refinement
 - Finding Hierarchies
 - An Example
- Business Dimensional Modeling
 - The Modeling Process
 - An Example

Module Three: Logical Data Models

- What to Model
 - The Data and Information Pipeline
- Understanding Data Structures

- Why Sources Matter
- Extracting Source Data Structure
- Source Data Profiling
- Logical Relational Modeling
 - The Modeling Process
 - Logical Models for Data Warehouse and ODS
 - A Data Warehouse Example
 - Logical Models for Marts and Reporting
- Logical Dimensional Modeling
 - Data Structure of Business Metrics
 - The Modeling Process
 - Modeling Meters and Measures
 - Adding the Dimensions
 - Refining and Enriching the Dimensions
 - Declaring the Grain
 - Refining and Enriching the Measures
- Logical Models and Business Metrics
 - Creating a Catalog of Metrics
 - Classifying Metrics
 - An Example
- Logical Models and Business Analytics
 - Analytics Applications
 - Data Mining Applications
- Logical Models and Master Data Management
 - Identity Management
 - Hierarchy Management
- Logical Models and Unstructured Data
 - Unstructured Data and Content Management
 - Unstructured Data and Text Analytics
 - Big Data

Module Four: Implementation Data Models

- Data Structure in Transaction Systems
 - Extracting the Structure of Existing Data
- Structural Modeling and Data Integration
 - From Business Models to Technology Models
 - Normalization
 - The Normalization Process
 - A Normalization Example
 - Time-Variant Data Structures
 - A Snapshot Example
 - An Audit Trail Example
 - An Example of States
 - Access, Navigation, Security, and Distribution
 - Access and Navigation Examples
 - Security and Distribution Examples
- Structural Modeling and Business Analytics
 - From Metrics Models to Technology Models

- Star-Schema Design
- Star-Schema Design Process
- Star-Schema Design - Modeling Dimension Tables
- Star-Schema Design - Dimension Table Key
- Star-Schema Design – Considering the Facts
- Star-Schema Design – Fact Table Key
- Analytic Application and Data Structures
- Data Mining Data Structures
- Physical Design Overview
 - The Results of Physical Design and Implementation
- Some Optimization Techniques
 - Derivation
 - Aggregation
 - Summarization
 - Horizontal Partitioning
 - Vertical Partitioning
 - Optimization Summary
- Physical Design and Implementation
 - Implementing Relational Data
 - Implementing Business Analytics
 - Implementing OLAP

Module Five: Summary and Conclusion

Appendix A: Entity-Relationship Modeling Basics

- Relational Data Design
 - Introduction to Entity/Relationship Modeling
- E/R Model Components
 - Entities and Attributes
 - Relationships
 - Subtypes and Supertypes
- Reading E/R Models
 - E/R Models for Communication

Appendix B: Case Study

Appendix C: Exercises

- Exercise One – Business Domains
- Exercise Two – Business Subjects
- Exercise Three – Fact Qualifier Matrix
- Exercise Four – Fact Qualifier Matrix Refinement
- Exercise Five – Logical Dimensional Model
- Exercise Six – Star Schema

Appendix D: Bibliography and References