

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 and Analytics
 - A Comprehensive Framework
 - Choosing the Right Techniques

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
 - Bottom-Up – Analytics Systems
- 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
- Qualifier Analysis and Refinement
 - Finding Hierarchies
- Fact-Qualifier Analysis Results
 - 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 E-R Modeling
 - The Modeling Process
 - Specialization and Generalization
 - Architected Decision Systems
 - The Data University Data Warehouse Logical Data Model
- Logical Dimensional Modeling
 - Business Metrics and Their Context
 - 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 Science and Predictive Analytics
- Logical Models and Master Data Management
 - Identity Management
 - Hierarchy Management
- Logical Models and Nonrelational Data
 - Big Data
 - Top-Down Versus Bottom-Up
 - Data Lake and Sandbox
 - Data Catalog

Module Four: Physical Data Models

- Defining Physical Modeling
 - Both Structural and Physical
- 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 Keys
 - Star-Schema Design – Considering the Facts
 - Star-Schema Design – Fact Table Key
 - Analytics Application Data Structures
 - Structures for Data Science and Self-Service Analytics
- 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 Decision System Data Structures
 - Implementing Analytics System Data Structures

Module Five: Summary and Conclusion

- A Quick Review
 - The Data Modeling Landscape
 - Summary of Key Points

Appendix A: Case Study

Appendix B: Exercises

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

Appendix C: Bibliography and References