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
• Logical E-R Modeling
  o The Modeling Process
  o Specialization and Generalization
  o Architected Decision Systems
  o The Data University Data Warehouse Logical Data Model

• Logical Dimensional Modeling
  o Business Metrics and Their Context
  o The Modeling Process
  o Modeling Meters and Measures
  o Adding the Dimensions
  o Refining and Enriching the Dimensions
  o Declaring the Grain
  o Refining and Enriching the Measures

• Logical Models and Business Metrics
  o Creating a Catalog of Metrics
  o Classifying Metrics
  o An Example

• Logical Models and Business Analytics
  o Analytics Applications
  o Data Science and Predictive Analytics

• Logical Models and Master Data Management
  o Identity Management
  o Hierarchy Management

• Logical Models and Nonrelational Data
  o Big Data
  o Top-Down Versus Bottom-Up
  o Data Lake and Sandbox
  o Data Catalog

**Module Four: Physical Data Models**

• Defining Physical Modeling
  o Both Structural and Physical

• Data Structure in Transaction Systems
  o Extracting the Structure of Existing Data

• Structural Modeling and Data Integration
  o From Business Models to Technology Models
  o Normalization
  o The Normalization Process
  o A Normalization Example
  o Time-Variant Data Structures
  o A Snapshot Example
  o An Audit Trail Example
  o An Example of States
  o Access, Navigation, Security, and Distribution
  o Access and Navigation Examples
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