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 Characteristics: Understanding Properties of Data
- Data Modeling Techniques: An Overview of Many Techniques
- Data Modeling Framework for BI: Where and What to Model

Module Two

Contextual Modeling
- Business Drivers, Goals, and Strategies
  - External Context
  - The Modeling Process
  - An Example
- Modeling Business Domains
  - Internal Context
  - The Modeling Process
  - Some Examples
- Collecting Information Needs
  - Information Context
  - The Modeling Process
  - An Example

Module Three

Conceptual Modeling
- Modeling Business Subjects
  - The Key to a Subject-Oriented Data Warehouse
  - The Modeling Process
  - Using the Domain Model
  - Using a Generic Model
  - An Example
- Gathering Business Questions
  - Collecting Data System Requirements
  - The Modeling Process
  - Working with the Business
  - An Example
- Modeling Facts and Qualifiers
  - Refining Data System Requirements
  - The Modeling Process
  - Mapping Business Questions
    - Finding the Facts
    - Fact/Qualifier Associations
    - An Example
  - Fact Analysis and Refinement
  - Qualifier Analysis and Refinement
- Modeling Information Flow
  - The Data-to-Information Pipeline
  - Modeling Process
  - An Example
Module Four

Logical Modeling and Data Integration

- Enterprise Logical Data Model
  - An Enterprise-Wide Business View
  - The Modeling Process: All-at-Once Approach
  - The Modeling Process: Incremental Approach
  - All-at-Once vs. Incremental
  - An Example

- Logical Models of Transaction Systems
  - An Application-Bounded Business View
  - The Modeling Process: A Top-Down Approach
  - The Modeling Process: A Bottom-Up Approach
  - Top-Down vs. Bottom-Up
  - An Example

- Logical Models of Integrated Data Stores
  - Business View of Data Warehouse and ODS
  - The Modeling Process
  - An Example

- Logical Models of Decision Systems
  - Business View of Relational Data Marts and Reporting Databases
  - The Modeling Process
  - An Example

- Data Integration and Master Data Management: Enterprise Reference Data

Module Five

Logical Modeling and Business Analytics

- Modeling Business Metrics
  - Business Measures
  - The Modeling Process
  - Identifying and Collecting Metrics
  - Classifying and Selecting Metrics
  - An Example

- Conforming Business Dimensions: Common Perspectives for Business Analytics

- 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
  - An Example

- Data Design for Analytic Systems
  - Delivery Systems for Business Analytics
  - Analytic Systems and Master Data Management
  - Enterprise Measures and Dimensions

Module Six

Structural Modeling

- Data Structure in Transaction Systems: 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
• Time-Variant Data Structures
  o A Snapshot Example
  o An Audit Trail Example
  o An Example of States
• Access, Navigation, Security, and Distribution
  o Access and Navigation Examples
  o Security and Distribution Examples
• Structural Modeling and Business Analytics
  o From Metrics Models to Technology Models
  o Star-Schema Design
    • The Design Process
    • Naming the Dimensions
    • Modeling Dimension Tables
    • Degenerate Dimensions
    • Dimension Table Keys
    • Fact Table Key
    • Supporting Calculated Measures
• Analytic Application Data Structures
• Data Mining Data Structures

Module Seven

Physical Modeling and Implementation
• Physical Design Overview: The Results of Physical Design and Implementation
• Some Optimization Techniques
  o Derivation
  o Aggregation
  o Summarization
  o Horizontal Partitioning
  o Vertical Partitioning
  o Optimization Summary
  o Physical Design and Implementation
• Implementing Relational Data
• Implementing Business Analytics
• Implementing OLAP

Appendices
Appendix A - Entity-Relationship Modeling Basics
• Relational Data Design
• Introduction to Entity/Relationship Modeling
  o E/R Model Components
    • Entities and Attributes
    • Relationships
    • Subtypes and Supertypes
  o Reading E/R Models: E/R Models for Communication

Appendix B - State Transition Modeling
• Introduction to State Transition Modeling
• Process Overview
• Model Example
• Model Components
• Status vs. State
• State Transition Modeling Techniques
  o Identifying State-Dependency
  o Identifying Actions and States
  o Identifying Conditions
  o Checking the Model