Mastering Distributed Application Design Using Microsoft Visual Studio (Preliminary Course)

Introduction

This workshop teaches students to analyze business requirements to determine data storage and data access requirements. Participants will learn to design data models and the data layer of a Microsoft® Windows® DNA architecture, and select the appropriate Microsoft technologies.

Exam: 70-100: Analyzing Requirements and Defining Solution Architectures

Prerequisites

This course assumes that the student has a minimum of beginning/intermediate programming skills as demonstrated by the following competencies:

- Understands basic programming terms and concepts
- Is familiar with programming tools (any vendor) for Microsoft Windows operating system or similar graphical programming environment
- Has built and debugged simple single-user desktop applications
- Is interested in Microsoft's recommendations on building distributed applications using Visual Studio Enterprise Edition

Course Outline

Module 1: Course Overview

Topics

Business Solutions Design Curriculum
Overview of This Course

Activity

Categorizing existing Information

Skills

Students will be able to:

- Describe how the course fits into the entire Business Solutions Design Curriculum.
Describe how you will use the case study to apply the principles you will learn in the course.

**Module 2: Solution Design Processes**

**Topics**

Design Processes  
Services-Based Design

**Activity**

Identifying Services

**Skills**

*Students will be able to:*

- Explain design processes as they pertain to business solutions and data-centric solutions.  
- Explain the concepts and benefits of services-based design.  
- Identify phases in the project life cycle.

**Module 3: Using a Conceptual Design for Data Requirements**

**Topics**

Investigation Process  
Data Requirements

**Activities**

Identifying Data-Related Use Cases and Data Requirements  
Relating Data Requirements to Conceptual Design

**Skills**

*Students will be able to:*

- Describe the information investigation process.  
- Determine functional data requirement from use cases.  
- Identify non-functional requirements that will affect a solution's design.
Module 4: Deriving a Logical Data Design

Topics

Logical Data Design
Entities and Attributes
Data Relationships
Entity/Relationship Modeling

Activities

Deriving entities and attributes from data requirements
Creating a logical data model

Skills

*Students will be able to:*

- Analyze data requirements to determine data entities and attributes.
- Analyze data entities and attributes to determine their relationships.
- Determine the cardinality and existence characteristics of a relationship.
- Create an entity/relationship diagram.

Module 5: Normalizing the Logical Data Design

Topics

Implementing Entity Relationships
Normalization Basics

Activities

Identifying keys in the logical model
Normalizing data

Skills

*Students will be able to:*

- Use primary and foreign keys to implement relationships between entities.
- Explain the benefits of normalizing entities.
- Normalize a table to third normal form.

Module 6: Deriving a Physical Data Design
Topics

Physical Data Design
Implementing Relationships
Data Optimization Techniques

Activities

Translating the logical data design
Optimizing a physical data design

Skills

Students will be able to:

- Derive a physical data design for tables and fields from a logical data design.
- Analyze data usage characteristics to optimize a physical data design.
- Determine methods for implementing relationships in a physical data design.
- Identify different optimization techniques.
- Determine the proper criteria for optimizing a physical data design.

Module 7: Implementing Data Integrity

Topics

Overview of Data Integrity
Implementing Data Integrity Requirements

Activities

Identifying data integrity requirements
Determining data integrity implementations

Skills

Students will be able to:

- Identify business rules that relate to data integrity.
- Identify the data integrity requirement type to which a business rule applies.
- Evaluate and determine a location for implementing data integrity.
- List implementation techniques for a given data integrity requirement.
Module 8: Designing Data Services

Topics

Overview of Data Services
Accessing Relational Data
Accessing Host-based Systems

Activities

Selecting data access technologies

Skills

Students will be able to:

• Determine the role of data services for a business solution.
• Describe considerations for distributing data access technologies.
• List the primary considerations for choosing a data access technology.
• List and describe Microsoft's primary data access technologies.
• Determine the appropriate data access technology for a business solution.

Module 9: Data Storage Considerations

Topics

Choosing a Database Product
Data Storage Technologies
Data Storage Considerations

Activity

Data quiz

Skills

Students will be able to:

• Identify different types of hardware and software technologies for implementing a data store.
• Choose the appropriate of hardware and software technologies for implementing a data store.