

## **Microsoft 2796**

# **Designing an Analysis Solution Architecture Using Microsoft SQL Server 2005 Analysis Services (SSAS)**

**Class Length:** 3 Days

### **Introduction**

Elements of this syllabus are subject to change.

The purpose of this 3-day course is to teach Business Intelligence (BI) professionals working in enterprise environments to design a multidimensional solution architecture that supports their BI solution. Students will go through the entire process—from capturing business and technical requirements to deploying a multidimensional solution to production. Students will also be taught to develop custom functionality and optimize a multidimensional solution.

### **Audience**

This course is intended for experienced BI professionals. The target students for this course already have an understanding of how to use the SQL Server 2005 tools to implement BI functionality, but need to develop their understanding of design principles and best practices when planning, implementing, and deploying an Analysis Services solution.

### **At Course Completion**

After completing this course, students will be able to:

- Capture the business and technical requirements for a BI solution.
- Design and implement a logical Online Analytical Processing (OLAP) solution architecture.
- Design physical storage for a multidimensional solution.
- Create calculated members and named sets.
- Implement Key Performance Indicators (KPIs), actions, and stored procedures.
- Design the infrastructure for an OLAP solution.
- Deploy and secure an Analysis Services solution in a production environment.
- Monitor and optimize an Analysis Services solution.
- Implement a Data Mining Solution.

### **Prerequisites**

Before attending this course, students must:

- Have hands-on experience with database development tasks. For example:
  - Creating Transact-SQL queries
  - Writing and optimizing advanced queries (for example, queries that contain complex joins or subqueries)
  - Creating database objects such as tables, views, and indexes
- Have foundational conceptual understanding of data warehousing, data marts, and Business Intelligence. Students must be well versed on the subjects of data warehousing, data marts, and BI, and preferably have read at least one book by Ralph Kimball or Bill Inmon.
- Conceptual understanding of OLAP technologies, multi-dimensional data, MDX, and relational

database modeling. For example, know what facts, dimensions, measures, calculated measures, and foreign keys are.

- Be familiar with SQL Server 2005 features, tools, and technologies. In particular, they must have built and queried a cube.
- Have foundational understanding of Microsoft Windows security. For example, how groups, delegation of credentials, and impersonation function in a security context.
- Have foundational understanding of Web-based architecture. For example, SSL, SOAP, and IIS—what they are and what their role is.
- Must understand the difference between replication and ETL.
- Already know how to use:
  - Microsoft Office Visio
  - Microsoft SQL Server Business Intelligence Development Studio
  - Microsoft SQL Server Management Studio
  - Performance Monitor
  - Microsoft SQL Server Profiler

## **Course Outline**

### **Module 1: Capturing Business and Technical Requirements**

In this module, students will first learn about key design principles that they should consider when you define the scope of a BI project. They will then learn how to identify the business and technical requirements to ensure that their solution meets the needs of its users.

#### **Lessons**

- Planning a Multidimensional Solution
- Identifying Requirements and Constraints

#### **Lab 1: Capturing Business and Technical Requirements**

- Reviewing Solution Requirements
- Identifying Further Information Requirements

After completing this module, students will be able to:

- Describe the purpose of a multidimensional solution.
- Identify requirements and constraints when designing a multidimensional solution.

### **Module 2: Designing and Implementing a Logical OLAP Solution Architecture**

This module describes considerations and guidelines for designing an OLAP solution, including a relational data warehouse and an Analysis Services cube.

#### **Lessons**

- Planning a Unified Dimensional Model
- Designing and Implementing Fact and Dimension Tables
- Designing and Implementing Cubes

#### **Lab 2: Designing and Implementing a UDM**

- Designing and Implementing a Relational Database Schema
- Designing and Implementing a Cube
- Designing and Implementing Perspectives

After completing this module, students will be able to:

- Describe design considerations for a UDM solution.
- Describe design considerations for the relational schema of an OLAP solution.
- Describe considerations for designing and implementing OLAP cubes.

### **Module 3: Designing Physical Storage for a Multidimensional Solution**

In this module, students will learn how to design an effective physical storage solution for a multidimensional application.

#### **Lessons**

- Designing Physical Storage
- Partitioning Relational Data
- Partitioning Multidimensional Data

#### **Lab 3: Designing and Implementing Physical Storage**

- Designing and Implementing a Storage Solution
- Designing and Implementing Relational Partitioning
- Designing and Implementing Multidimensional Partitioning
- Testing the Solution

After completing this module, students will be able to:

- Design an effective physical storage solution for dimensions and measures.
- Partition relational data.
- Partition multidimensional data.

### **Module 4: Creating Calculations**

In this module, students will learn how to create Multidimensional Expression (MDX) calculations. The module describes how to create calculated members, named sets, and scoped assignments.

#### **Lessons**

- Implementing Calculated Members
- Implementing Named Sets
- Implementing Scoped MDX Scripts

#### **Lab 4: Implementing Calculations**

- Creating Calculated Members
- Creating Named Sets
- Creating a Scoped MDX Script

After completing this module, students will be able to:

- Create calculated members.
- Create named sets.
- Create scoped assignments.

### **Module 5: Extending Cube Functionality**

In this module, students will learn about the benefits of KPIs, actions, and stored procedures. They will also learn how to implement KPIs, actions, and stored procedures in an Analysis Services cube.

#### **Lessons**

- Key Performance Indicators
- Actions
- Stored Procedures

### **Lab 5: Implementing Advanced Functionality**

- Creating KPIs
- Creating Actions
- Creating Stored Procedures

After completing this module, students will be able to:

- Create KPIs.
- Create actions.
- Create stored procedures.

### **Module 6: Designing an Analysis Services Infrastructure**

In this module, students will learn how to design an appropriate infrastructure for an OLAP application.

#### **Lessons**

- Considerations for Analysis Services Resource Requirements
- Considerations for Analysis Services Scalability
- Considerations for Analysis Services Availability

### **Lab 6: Designing and Implementing Analysis Services Infrastructure**

- Planning Production System Infrastructure
- Installing Analysis Services in a Cluster

After completing this module, students will be able to:

- Specify appropriate hardware and software resources for an Analysis Services solution.
- Design an Analysis Services infrastructure that supports high scalability.

- Design an Analysis Services infrastructure that supports high availability.

### **Module 7: Deploying a Multidimensional Solution into Production**

In this module, students will learn about and compare the different deployment methods available in SQL Server 2005 Analysis Services. They will also learn about how security in Analysis Services functions and how to protect their company's critical business information.

#### **Lessons**

- Deploying an Analysis Services Database
- Managing Analysis Services Security

#### **Lab 7: Deploying Analysis Services into Production**

- Deploying an Analysis Services Database
- Enabling User Access

After completing this module, students will be able to:

- Deploy an Analysis Services solution.
- Secure an Analysis Services solution.

### **Module 8: Optimizing an OLAP Solution**

In this module, students will learn how to monitor Analysis Services and how to optimize performance of their Analysis Services solutions.

#### **Lessons**

- Monitoring Analysis Services
- Optimizing Performance

#### **Lab 8: Optimizing Analysis Services**

- Monitoring Analysis Services
- Optimizing the Relational Database
- Optimizing Queries

After completing this module, students will be able to:

- Monitor Analysis Services.
- Optimize Analysis Services performance.

### **Module 9: Implementing Data Mining**

In this module, students will learn what a data mining solution is and how to design and implement data mining functionality with SQL Server Analysis Services.

#### **Lessons**



- Introduction to Data Mining
- Implementing a Data Mining Solution
- Using Data Mining in a BI Solution

### **Lab 5: Implementing Data Mining**

- Creating a Data Mining Structure
- Validating a Data Mining Structure

After completing this module, students will be able to:

- Plan a data mining solution.
- Implement a data mining solution.
- Use data mining in a BI solution.