

Course Name	Course 20767B: Implementing a SQL Data Warehouse
Course Duration	5 Days
Course Structure	Instructor-Led
Course Overview	<p>This five-day instructor-led course provides students with the knowledge and skills to provision a Microsoft SQL Server 2016 database. The course covers SQL Server 2016 provision both on-premise and in Azure, and covers installing from new and migrating from an existing install.</p> <p>Audience profile</p> <p>The primary audience for this course are database professionals who need to fulfil a Business Intelligence Developer role. They will need to focus on hands-on work creating BI solutions including Data Warehouse implementation, ETL, and data cleansing.</p>
Course Outcome	<p>After completing this course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the key elements of a data warehousing solution • Describe the main hardware considerations for building a data warehouse • Implement a logical design for a data warehouse • Implement a physical design for a data warehouse • Create columnstore indexes • Implementing an Azure SQL Data Warehouse • Describe the key features of SSIS • Implement a data flow by using SSIS • Implement control flow by using tasks and precedence constraints • Create dynamic packages that include variables and parameters • Debug SSIS packages • Describe the considerations for implement an ETL solution • Implement Data Quality Services • Implement a Master Data Services model • Describe how you can use custom components to extend SSIS • Deploy SSIS projects • Describe BI and common BI scenarios
Course Details	<p>Topic 1: Introduction to Data Warehousing</p> <p>This topic describes data warehouse concepts and architecture consideration.</p>

	<p>Lessons</p> <ul style="list-style-type: none">• Overview of Data Warehousing• Considerations for a Data Warehouse Solution <p>Lab: Exploring a Data Warehouse Solution</p> <ul style="list-style-type: none">• Exploring data sources• Exploring an ETL process• Exploring a data warehouse <p>After completing this topic, you will be able to:</p> <ul style="list-style-type: none">• Describe the key elements of a data warehousing solution• Describe the key considerations for a data warehousing solution <p>Topic 2: Planning Data Warehouse Infrastructure</p> <p>This topic describes the main hardware considerations for building a data warehouse.</p> <p>Lessons</p> <ul style="list-style-type: none">• Considerations for data warehouse infrastructure.• Planning data warehouse hardware. <p>Lab: Planning Data Warehouse Infrastructure</p> <ul style="list-style-type: none">• Planning data warehouse hardware <p>After completing this topic, you will be able to:</p> <ul style="list-style-type: none">• Describe the main hardware considerations for building a data warehouse• Explain how to use reference architectures and data warehouse appliances to create a data warehouse <p>Topic 3: Designing and Implementing a Data Warehouse</p> <p>This topic describes how you go about designing and implementing a schema for a data warehouse.</p> <p>Lessons</p> <ul style="list-style-type: none">• Designing dimension tables• Designing fact tables• Physical Design for a Data Warehouse
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Lab: Implementing a Data Warehouse Schema

- Implementing a star schema
- Implementing a snowflake schema
- Implementing a time dimension table

After completing this topic, you will be able to:

- Implement a logical design for a data warehouse
- Implement a physical design for a data warehouse

Topic 4: Columnstore Indexes

This topic introduces Columnstore Indexes.

Lessons

- Introduction to Columnstore Indexes
- Creating Columnstore Indexes
- Working with Columnstore Indexes

Lab: Using Columnstore Indexes

- Create a Columnstore index on the FactProductInventory table
- Create a Columnstore index on the FactInternetSales table
- Create a memory optimized Columnstore table

After completing this topic, you will be able to:

- Create Columnstore indexes
- Work with Columnstore Indexes

Topic 5: Implementing an Azure SQL Data Warehouse

This topic describes Azure SQL Data Warehouses and how to implement them.

Lessons

- Advantages of Azure SQL Data Warehouse
- Implementing an Azure SQL Data Warehouse
- Developing an Azure SQL Data Warehouse
- Migrating to an Azure SQ Data Warehouse
- Copying data with the Azure data factory

Lab: Implementing an Azure SQL Data Warehouse

- Create an Azure SQL data warehouse database

- Migrate to an Azure SQL Data warehouse database
- Copy data with the Azure data factory

After completing this topic, you will be able to:

- Describe the advantages of Azure SQL Data Warehouse
- Implement an Azure SQL Data Warehouse
- Describe the considerations for developing an Azure SQL Data Warehouse
- Plan for migrating to Azure SQL Data Warehouse

Topic 6: Creating an ETL Solution

At the end of this topic you will be able to implement data flow in a SSIS package.

Lessons

- Introduction to ETL with SSIS
- Exploring Source Data
- Implementing Data Flow

Lab: Implementing Data Flow in an SSIS Package

- Exploring source data
- Transferring data by using a data row task
- Using transformation components in a data row

After completing this topic, you will be able to:

- Describe ETL with SSIS
- Explore Source Data
- Implement a Data Flow

Topic 7: Implementing Control Flow in an SSIS Package

This topic describes implementing control flow in an SSIS package.

Lessons

- Introduction to Control Flow
- Creating Dynamic Packages
- Using Containers
- Managing consistency.

Lab: Implementing Control Flow in an SSIS Package

- Using tasks and precedence in a control flow

- Using variables and parameters
- Using containers

Lab: Using Transactions and Checkpoints

- Using transactions
- Using checkpoints

After completing this topic, you will be able to:

- Describe control flow
- Create dynamic packages
- Use containers

Topic 8: Debugging and Troubleshooting SSIS Packages

This topic describes how to debug and troubleshoot SSIS packages.

Lessons

- Debugging an SSIS Package
- Logging SSIS Package Events
- Handling Errors in an SSIS Package

Lab: Debugging and Troubleshooting an SSIS Package

- Debugging an SSIS package
- Logging SSIS package execution
- Implementing an event handler
- Handling errors in data flow

After completing this topic, you will be able to:

- Debug an SSIS package
- Log SSIS package events
- Handle errors in an SSIS package

Topic 9: Implementing a Data Extraction Solution

This topic describes how to implement an SSIS solution that supports incremental DW loads and changing data.

Lessons

- Introduction to Incremental ETL
- Extracting Modified Data
- Loading modified data
- Temporal Tables

Lab: Extracting Modified Data

- Using a datetime column to incrementally extract data
- Using change data capture
- Using the CDC control task
- Using change tracking

Lab: Loading a data warehouse

- Loading data from CDC output tables
- Using a lookup transformation to insert or update dimension data
- Implementing a slowly changing dimension
- Using the merge statement

After completing this topic, you will be able to:

- Describe incremental ETL
- Extract modified data
- Load modified data.
- Describe temporal tables

Topic 10: Enforcing Data Quality

This topic describes how to implement data cleansing by using Microsoft Data Quality services.

Lessons

- Introduction to Data Quality
- Using Data Quality Services to Cleanse Data
- Using Data Quality Services to Match Data

Lab: Cleansing Data

- Creating a DQS knowledge base
- Using a DQS project to cleanse data
- Using DQS in an SSIS package

Lab: De-duplicating Data

- Creating a matching policy
- Using a DS project to match data

After completing this topic, you will be able to:

- Describe data quality services
- Cleanse data using data quality services
- Match data using data quality services
- De-duplicate data using data quality services

Topic 11: Using Master Data Services

This topic describes how to implement master data services to enforce data integrity at source.

Lessons

- Introduction to Master Data Services
- Implementing a Master Data Services Model
- Hierarchies and collections
- Creating a Master Data Hub

Lab: Implementing Master Data Services

- Creating a master data services model
- Using the master data services add-in for Excel
- Enforcing business rules
- Loading data into a model
- Consuming master data services data

After completing this topic, you will be able to:

- Describe the key concepts of master data services
- Implement a master data service model
- Manage master data
- Create a master data hub

Topic 12: Extending SQL Server Integration Services (SSIS)

This topic describes how to extend SSIS with custom scripts and components.

Lessons

- Using scripting in SSIS
- Using custom components in SSIS

Lab: Using scripts

- Using a script task

After completing this topic, you will be able to:

- Use custom components in SSIS
- Use scripting in SSIS

Topic 13: Deploying and Configuring SSIS Packages

This topic describes how to deploy and configure SSIS packages.

Lessons

- Overview of SSIS Deployment
- Deploying SSIS Projects
- Planning SSIS Package Execution

Lab: Deploying and Configuring SSIS Packages

- Creating an SSIS catalog
- Deploying an SSIS project
- Creating environments for an SSIS solution
- Running an SSIS package in SQL server management studio
- Scheduling SSIS packages with SQL server agent

After completing this topic, you will be able to:

- Describe an SSIS deployment
- Deploy an SSIS package
- Plan SSIS package execution

Topic 14: Consuming Data in a Data Warehouse

This topic describes how to debug and troubleshoot SSIS packages.

Lessons

- Introduction to Business Intelligence
- An Introduction to Data Analysis
- Introduction to reporting
- Analyzing Data with Azure SQL Data Warehouse

Lab: Using a data warehouse

- Exploring a reporting services report
- Exploring a PowerPivot workbook
- Exploring a power view report

After completing this topic, you will be able to:

- Describe at a high level business intelligence
 - Show an understanding of reporting
 - Show an understanding of data analysis
- Analyze data with Azure SQL data warehouse

