

Microsoft SQL Bootcamp Courses

**Bootcamp Title – MCSA: SQL Server (1 Cert)**  
Number of Days – 9   
Number of Exams – 3  
Number of Certifications – 1  
Cost - $5,995

Certifications:

MCSA: SQL Server 2012

Exams:

**70-461**: Querying Microsoft SQL Server 2012

**70-462:**Administering a Microsoft SQL Server 2012 Database

**70-463:**Implementing Data Warehouses with Microsoft SQL Server 2012

Course Description:

The MCSA: SQL Server Bootcamp is 9 days of an intense deep dive into every aspect of SQL Server including query, administration and data warehousing. Our program incorporates Microsoft Courses: 20461 Querying Microsoft SQL Server 2012 & 20462 Administering Microsoft SQL Server Databases & 20463 Implementing a Data Warehouse with Microsoft SQL Server.

While attending this training program - you take three exams to test and certify for the Microsoft Certified Solutions Associate: SQL Server 2012 official certification. If your goal is to learn how to use SQL Server 2012 and pass the certification exam - you've found the right place. This course is a hybrid of actual hands on learning combined with focused materials mapped to exam objectives.

Prerequisites:

The candidate works in an admin/development environment that uses SQL Server technologies.

Class Objectives (*Following information customized from Microsoft Learning Test Objectives)*

**Module 1: Introduction to Microsoft SQL Server 2012**This module introduces the SQL Server platform and major tools. It discusses editions, versions, tools used to query, documentation sources, and the logical structure of databases.**Lessons**

* Introducing Microsoft SQL Server 2012
* Getting Started with SQL Server Management Studio

**Lab : Working with SQL Server 2012 Tools**

* Working with SQL Server Management Studio
* Creating and Organizing T-SQL scripts
* Using Books Online

After completing this module, students will be able to:

* Describe the architecture and editions of SQL Server 2012.
* Work with SQL Server Management Studio.

**Module 2: Getting Started with SQL Azure**

This module introduces you to the concepts of SQL Azure.  If the virtual machines in your classroom are able to connect to the internet and you have a Windows Azure account you may be able to connect to your Azure server and database.  Many of the labs in the rest of this course are enabled for you to perform the lab while connected to your own Azure database in the cloud.

**Lessons**

* Overview of SQL Azure
* Working with SQL Azure

After completing this module, students will be able to:

* Describe the basic features of SQL Azure.
* Provision a SQL Azure server and configure its security.

**Module 3: Introduction to T-SQL Querying**This module introduces Transact SQL as the primary querying language of SQL Server. It discusses the basic structure of T-SQL queries, the logical flow of a SELECT statement, and introduces concepts such as predicates and set-based operations.**Lessons**

* Introducing T-SQL
* Understanding Sets
* Understanding Predicate Logic
* Understanding the Logical Order of Operations in SELECT statements

**Lab : Introduction to Transact-SQL Querying**

* Executing Basic SELECT Statements
* Executing queries which filter data using predicates
* Executing queries which sort data using ORDER BY

After completing this module, students will be able to:

* Describe the elements of T-SQL and their role in writing queries
* Describe the use of sets in SQL Server
* Describe the use of predicate logic in SQL Server
* Describe the logical order of operations in SELECT statements

**Module 4: Writing SELECT Queries**This module introduces the fundamentals of the SELECT statement, focusing on queries against a single table.**Lessons**

* Writing Simple SELECT Statements
* Eliminating Duplicates with DISTINCT
* Using Column and Table Aliases
* Writing Simple CASE Expressions

**Lab : Writing Basic SELECT Statements**

* Write simple SELECT Statements
* Eliminate Duplicates Using Distinct
* Use Table and Column Aliases
* Use a Simple CASE Expression

After completing this module, students will be able to:

* Write simple SELECT statements.
* Eliminate duplicates using the DISTINCT clause.
* Use column and table aliases.
* Write simple CASE expressions.

**Module 5: Querying Multiple Tables**This module explains how to write queries which combine data from multiple sources in SQL Server. The module introduces the use of JOINs in T-SQL queries as a mechanism for retrieving data from multiple tables.**Lessons**

* Understanding Joins
* Querying with Inner Joins
* Querying with Outer Joins
* Querying with Cross Joins and Self Joins

**Lab : Querying Multiple Tables**

* Writing Queries That Use Inner Joins
* Writing Queries That Use Multiple-Table Inner Join
* Writing Queries That Use Self Joins
* Writing Queries That Use Outer Loins
* Writing Queries That Use Cross Join

After completing this module, students will be able to:

* Describe how multiple tables may be queried in a SELECT statement using joins.
* Write queries that use inner joins.
* Write queries that use outer joins.
* Write queries that use self-joins and cross joins.

**Module 6: Sorting and Filtering Data**This module explains how to enhance queries to limit the rows they return, and to control the order in which the rows are displayed. The module also discusses how to resolve missing and unknown results.**Lessons**

* Sorting Data
* Filtering Data with a WHERE Clause
* Filtering with the TOP and OFFSET-FETCH Options
* Working with Unknown and Missing Values

**Lab : Sorting and Filtering Data**

* Writing Queries That Filter Data Using a WHERE Clause
* Writing Queries That Filter Data Using an ORDER BY Clause
* Writing Queries That Filter Data Using the TOP Option
* Writing Queries That Filter Data Using the OFFSET-FETCH Clause

After completing this module, students will be able to:

* Filter data with predicates in the WHERE clause.
* Sort data using ORDER BY.
* Filter data in the SELECT clause with TOP.
* Filter data with OFFSET and FETCH.

**Module 7: Working with SQL Server 2012 Data Types**This module explains the data types SQL Server uses to store data. It introduces the many types of numeric and special-use data types. It also explains conversions between data types, and the importance of type precedence.**Lessons**

* Introducing SQL Server 2012 Data Types
* Working with Character Data
* Working with Date and Time Data

**Lab : Working with SQL Server 2012 Data Types**

* Writing Queries That Return Date and Time Data
* Writing Queries That Use Date and Time Functions
* Writing Queries That Return Character Data
* Writing Queries That Use Character Functions

After completing this module, students will be able to:

* Describe numeric data types, type precedence and type conversions.
* Write queries using character data types.
* Write queries using date and time data types.

**Module 8: Using Built-In Functions**This module introduces the use of functions that are built in to SQL Server Denali, and will discuss some common usages including data type conversion, testing for logical results and nullability.**Lessons**

* Writing Queries with Built-In Functions
* Using Conversion Functions
* Using Logical Functions
* Using Functions to Work with NULL

**Lab : Using Built-In Functions**

* Write queries which use conversion functions
* Write queries which use logical functions
* Write queries which test for nullability

After completing this module, students will be able to:

* Write queries with built-in scalar functions.
* Use conversion functions.
* Use logical functions.
* Use functions that work with NULL.

**Module 9: Grouping and Aggregating Data**This module introduces methods for grouping data within a query, aggregating the grouped data and filtering groups with HAVING. The module is designed to help the student grasp why a SELECT clause has restrictions placed upon column naming in the GROUP BY clause as well as which columns may be listed in the SELECT clause.**Lessons**

* Using Aggregate Functions
* Using the GROUP BY Clause
* Filtering Groups with HAVING

**Lab : Grouping and Aggregating Data**

* Write queries which use the GROUP BY clause
* Write queries which use aggregate functions
* Write queries which use distinct aggregate functions
* Write queries which filter groups with the HAVING clause

After completing this module, students will be able to:

* Write queries which summarize data using built-in aggregate functions.
* Use the GROUP BY clause to arrange rows into groups.
* Use the HAVING clause to filter out groups based on a search condition.

**Module 10: Using Subqueries**This module will introduce the use of subqueries in various parts of a SELECT statement. It will include the use of scalar and multi-result subqueries, and the use of the IN and EXISTS operators.**Lessons**

* Writing Self-Contained Subqueries
* Writing Correlated Subqueries
* Using the EXISTS Predicate with Subqueries

**Lab : Using Subqueries**

* Write queries which use self-contained subqueries
* Write queries which use scalar and multi-result subqueries
* Write queries which use correlated subqueries and EXISTS predicate

After completing this module, students will be able to:

* Describe the uses of queries which are nested within other queries.
* Write self-contained subqueries which return scalar or multi-valued results.
* Write correlated subqueries which return scalar or multi-valued results.
* Use the EXISTS predicate to efficiently check for the existence of rows in a subquery.

**Module 11: Using Table Expressions**This module introduces T-SQL expressions which return a valid relational table, typically for further use in the query. The module discusses views, derived tables, common table expressions and inline table-valued functions.**Lessons**

* Using Derived Tables
* Using Common Table Expressions
* Using Views
* Using Inline Table-Valued Functions

**Lab : Using Table Expressions**

* Write Queries Which Use Views
* Write Queries Which Use Derived Tables
* Write Queries Which Use Common Table Expressions
* Write Queries Which Use Inline Table-Valued Functions

After completing this module, students will be able to:

* Write queries which use derived tables.
* Write queries which use common table expressions.
* Create simple views and write queries against them.
* Create simple inline table-valued functions and write queries against them.

**Module 12: Using Set Operators**This module introduces operations involving multiple sets of data. It will cover the use of the UNION, UNION ALL, APPLY, CROSS APPLY, OUTER APPLY operators as well as the EXCEPT and INTERSECTS operators.**Lessons**

* Writing Queries with the UNION Operator
* Using EXCEPT and INTERSECT
* Using APPLY

**Lab : Using Set Operators**

* Write queries which use UNION set operators and UNION ALL multi-set operators
* Write queries which use CROSS APPLY and OUTER APPLY operators
* Write queries which use EXCEPT and INTERSECT operators

After completing this module, students will be able to:

* Write queries which combine data using the UNION operator
* Write queries which compare sets using the INTERSECT and EXCEPT operators
* Write queries which manipulate rows in a table by using APPLY with the results of a derived table or function

**Module 13: Using Window Ranking, Offset and Aggregate Functions**This module introduces window functions including ranking, aggregate and offset functions. Much of this functionality is new to SQL Server 2012. It will cover the use of T-SQL functions such as ROW\_NUMBER, RANK, DENSE\_RANK, NTILE, LAG, LEAD, FIRST\_VALUE and LAST\_VALUE to perform calculations against a set, or window, of rows.**Lessons**

* Creating Windows with OVER
* Exploring Window Functions

**Lab : Using Window Ranking, Offset and Aggregate Functions**

* Write queries which use ranking functions
* Write queries which use offset functions
* Write queries which use window aggregate functions

After completing this module, students will be able to:

* Describe the benefits to using window functions.
* Restrict window functions to rows defined in an OVER clause, including partitions and frames.
* Write queries which use window functions to operate on a window of rows and return ranking, aggregation and offset comparison results.

**Module 14: Pivoting and Grouping Sets**This module discusses techniques for pivoting data in T-SQL as well to introduce the fundamentals of the GROUPING SETS clause. It will also cover the use of GROUP BY ROLLUP and GROUP BY CUBE syntax in SQL Server 2012.**Lessons**

* Writing Queries with PIVOT and UNPIVOT
* Working with Grouping Sets

**Lab : Pivoting and Grouping Sets**

* Write queries which use the PIVOT operator
* Write queries which use the UNPIVOT operator
* Write queries which use the GROUPING SETS subclause

After completing this module, students will be able to:

* Write queries which pivot and unpivot result sets
* Write queries which specify multiple groupings with grouping sets

**Module 15: Querying SQL Server Metadata**This module introduces the use of SQL Server system objects in T-SQL queries. It will cover the use of system catalog views, system stored procedures, system functions, and dynamic management objects.**Lessons**

* Querying System Catalog Views and Functions
* Executing System Stored Procedures
* Querying Dynamic Management Objects

**Lab : Querying SQL Server Metadata**

* Querying System Catalog Views
* Querying System Functions
* Querying System Dynamic Management Views

After completing this module, students will be able to:

* Write queries that retrieve system metadata using system views and functions.
* Execute system stored procedures to return system information.
* Write queries that retrieve system metadata and state information using system dynamic management views and functions.

**Module 16: Executing Stored Procedures**This module introduces the use of existing stored procedures in a T-SQL querying environment. It discusses the use of EXECUTE, how to pass input and output parameters to a procedure, and how to invoke system stored procedures.**Lessons**

* Querying Data with Stored Procedures
* Passing Parameters to Stored Procedures
* Creating Simple Stored Procedures
* Working with Dynamic SQL

**Lab : Executing Stored Procedures**

* Use the EXECUTE statement to invoke stored procedures
* Pass parameters to stored procedures
* Execute system stored procedures

After completing this module, students will be able to:

* Return results by executing stored procedures.
* Pass parameters to procedures.
* Create simple stored procedures which encapsulate a SELECT statement.
* Construct and execute dynamic SQL with EXEC and sp\_executesql.

**Module 17: Programming with T-SQL**This module provides a basic introduction to T-SQL programming concepts and objects. It discusses batches, variables, control of flow elements such as loops and conditionals, how to create and execute dynamic SQL statements, and how to use synonyms.**Lessons**

* T-SQL Programming Elements
* Controlling Program Flow

**Lab : Programming with T-SQL**

* Declaring Variables and Delimiting Batches
* Using Control-of-Flow Elements
* Generating Dynamic SQL
* Using Synonyms

After completing this module, students will be able to:

* Describe the language elements of T-SQL used for simple programming tasks.
* Describe batches and how they are handled by SQL Server.
* Declare and assign variables and synonyms.
* Use IF and WHILE blocks to control program flow.

**Module 18: Implementing Error Handling**This module introduces the use of error handlers in T-SQL code. It will introduce the difference between compile errors and run-time errors, and will cover how errors affect batches. The module will also cover how to control error handling using TRY/CATCH blocks, the use of the ERROR class of functions, and the use of the new THROW statement.**Lessons**

* Using TRY / CATCH Blocks
* Working with Error Information

**Lab : Implementing Error Handling**

* Redirecting Errors with TRY / CATCH
* Using THROW to Pass an Error Message Back to a Client

After completing this module, students will be able to:

* Describe SQL Server's behavior when errors occur in T-SQL code.
* Implement structured exception handling in T-SQL.
* Return information about errors from system objects.
* Raise user-defined errors and pass system errors in T-SQL code.

**Module 19: Implementing Transactions**This module introduces the concepts of transaction management in SQL Server. It will provide a high-level overview of transaction properties, cover the basics of marking transactions with BEGIN, COMMIT and ROLLBACK.**Lessons**

* Transactions and the Database Engine
* Controlling Transactions

**Lab : Implementing Transactions**

* Controlling transactions with BEGIN, COMMIT, and ROLLBACK
* Adding error handling to a CATCH block

After completing this module, students will be able to:

* Describe transactions and the differences between batches and transactions.
* Describe batches and how they are handled by SQL Server.
* Create and manage transactions with transaction control language statements.
* Use SET XACT\_ABORT to define SQL Server's handling of transactions outside TRY / CATCH blocks.

**Module 20: Improving Query Performance**This module introduces the concepts of system resource usage and the performance impact of querying SQL Server 2012. It will cover, at a high level, the use of indexes in SQL Server, the use of execution plans in SQL Server Management Studio, and the use of SET options to view system resource usage when executing queries. It will also compare set-based operations with cursor-based operations.**Lessons**

* Factors in Query Performance
* Displaying Query Performance Data

**Lab : Improving Query Performance**

* Viewing Query Execution Plans
* Viewing Index Usage and Using SET STATISTICS Statements

After completing this module, students will be able to:

* Describe components of well-performing queries.
* Describe the role of indexes and statistics in SQL Server
* Display and interpret basic query plans
* Display and interpret basic query performance data

**Module 1: Introduction to SQL Server 2012 and its Toolset**This module introduces the entire SQL Server platform and its major tools. It covers editions, versions, basics of network listeners, and concepts of services and service accounts.**Lessons**

* Introduction to the SQL Server Platform
* Working with SQL Server Tools
* Configuring SQL Server Services

**Lab : Introduction to SQL Server and its Toolset**

* Verifying SQL Server Component Installation
* Altering Service Accounts for New Instance
* Enabling Named Pipes Protocol for Both Instances
* Creating an Alias for AdvDev
* Ensuring SQL Browser is Disabled and Configure a Fixed TCP/IP Port (Only if time permits

After completing this module, students will be able to:

* Describe the SQL Server Platform.
* Work with SQL Server Tools.
* Configure SQL Server Services.

**Module 2: Preparing Systems for SQL Server 2012**This module covers planning for an installation related to SQL Server I/O requirements, 32 bit vs 64 bit, memory configuration options and I/O subsystem pre-installation checks using SQLIOSim and SQLIO.**Lessons**

* Overview of SQL Server Architecture
* Planning Server Resource Requirements
* Pre-installation Testing for SQL Server

**Lab : Preparing Systems for SQL Server**

* Adjust memory configuration
* Pre-installation Stress Testing
* Check Specific I/O Operations

After completing this module, students will be able to:

* Describe the SQL Server architecture.
* Plan for server resource requirements.
* Conduct pre-installation stress testing for SQL Server.

**Module 3: Installing and Configuring SQL Server 2012**This module details installing and configuring SQL Server.**Lessons**

* Preparing to Install SQL Server
* Installing SQL Server
* Upgrading and Automating Installation

**Lab : Installing and Configuring SQL Server**

* Review installation requirements
* Install the SQL Server instance
* Perform Post-installation Setup and Checks
* Configure Server Memory

After completing this module, students will be able to:

* Prepare to install SQL Server.
* Install SQL Server.
* Upgrade and automate the installation of SQL Server.

**Module 4: Working with Databases**This module describes how data is stored in databases, how to create databases, and how to move databases either within a server or between servers.**Lessons**

* Overview of SQL Server Databases
* Working with Files and Filegroups
* Moving Database Files

**Lab : Working with Databases**

* Adjust tempdb configuration
* Create the RateTracking database
* Attach the OldProspects database
* Add multiple files to tempdb

After completing this module, students will be able to:

* Describe the role and structure of SQL Server databases.
* Work with files and filegroups.
* Move database files within servers and between servers.

**Module 5: Understanding SQL Server 2012 Recovery Models**This module describes the concept of the transaction log and SQL Server recovery models. It introduces the different backup strategies available with SQL Server.**Lessons**

* Backup Strategies
* Understanding SQL Server Transaction Logging
* Planning a SQL Server Backup Strategy

**Lab : Understanding SQL Server Recovery Models**

* Plan a backup strategy
* Configure Recovery Models
* Review recovery models and strategy

After completing this module, students will be able to:

* Describe the critical concepts surrounding backup strategies.
* Explain the transaction logging capabilities within the SQL Server database engine.
* Plan a SQL Server backup strategy.

**Module 6: Backup of SQL Server 2012 Databases**This module describes SQL Server Backup and the backup types.**Lessons**

* Backing up Databases and Transaction Logs
* Managing Database Backups
* Working with Backup Options

**Lab : Backup of SQL Server Databases**

* Investigate backup compression
* Transaction log backup
* Differential backup
* Copy-only backup
* Partial backup

After completing this module, students will be able to:

* Back up databases and transaction logs.
* Manage database backups.
* Work with more advanced backup options.

**Module 7: Restoring SQL Server 2012 Databases**This module describes the restoration of databases.**Lessons**

* Understanding the Restore Process
* Restoring Databases
* Working with Point-in-time recovery
* Restoring System Databases and Individual Files

**Lab : Restoring SQL Server 2012 Databases**

* Determine a restore strategy
* Restore the database
* Using STANDBY mode

After completing this module, students will be able to:

* Understand the restore process.
* Restore databases.
* Work with Point-in-time Recovery.
* Restore system databases and individual files.

**Module 8: Importing and Exporting Data**This module covers the use of the import/export wizards and explains how they relate to SSIS. Also introduces BCP.**Lessons**

* Transferring Data To/From SQL Server
* Importing and Exporting Table Data
* Inserting Data in Bulk

**Lab : Importing and Exporting Data**

* Import the Excel spreadsheet
* Import the CSV file
* Create and test an extraction package
* Compare loading performance

After completing this module, students will be able to:

* Transfer data to and from SQL Server.
* Import and export table data.
* Insert data in bulk and optimize the bulk insert process.

**Module 9: Authenticating and Authorizing Users**This module covers SQL Server security models, logins and users.**Lessons**

* Authenticating Connections to SQL Server
* Authorizing Logins to Access Databases
* Authorization Across Servers

**Lab : Authenticating and Authorizing Users**

* Create Logins
* Correct an Application Login Issue
* Create Database Users
* Correct Access to Restored

After completing this module, students will be able to:

* Describe how SQL Server authenticates connections.
* Describe how logins are authorized to access databases.
* Explain the requirements for authorization across servers.

**Module 10: Assigning Server and Database Roles**This module covers fixed server roles, user-defined server roles, fixed database roles and user-defined database roles.**Lessons**

* Working with Server Roles
* Working with Fixed Database Roles
* Creating User-defined Database Roles

**Lab : Assigning Server and Database Roles**

* Assign Server Roles
* Assign Fixed Database Roles
* Create and Assign User-defined Database Roles
* Check Role Assignments

After completing this module, students will be able to:

* Work with server roles.
* Work with fixed database roles.
* Create user-defined database roles.

**Module 11: Authorizing Users to Access Resources**This module covers permissions and the assignment of permissions.**Lessons**

* Authorizing User Access to Objects
* Authorizing Users to Execute Code
* Configuring Permissions at the Schema Level

**Lab : Authorizing Users to Access Resources**

* Assign Schema-level Permissions
* Assign Object-level Permissions
* Test Permissions

After completing this module, students will be able to:

* Authorize user access to objects.
* Authorize users to execute code.
* Configure permissions at the schema level.

**Module 12: Auditing SQL Server Environments**This module covers SQL Server Audit.**Lessons**

* Options for Auditing Data Access in SQL
* Implementing SQL Server Audit
* Managing SQL Server Audit

**Lab : Auditing SQL Server Environments**

* Determine audit configuration and create audit
* Create server audit specifications
* Create database audit specifications
* Test audit functionality

After completing this module, students will be able to:

* Describe the options for auditing data access in SQL Server.
* Implement SQL Server Audit.
* Manage SQL Server Audit.

**Module 13: Automating SQL Server 2012 Management**This module covers SQL Server Agent, jobs and job history.**Lessons**

* Automating SQL Server Management
* Working with SQL Server Agent
* Managing SQL Server Agent Jobs

**Lab : Automating SQL Server Management**

* Create a Data Extraction Job
* Schedule the Data Extraction Job
* Troubleshoot a Failing Job

After completing this module, students will be able to:

* Automate SQL Server Management.
* Work with SQL Server Agent.
* Manage SQL Server Agent jobs.

**Module 14: Configuring Security for SQL Server Agent**This module covers SQL Server agent security, proxy accounts and credentials.**Lessons**

* Understanding SQL Server Agent Security
* Configuring Credentials
* Configuring Proxy Accounts

**Lab : Configuring Security for SQL Server Agent**

* Troubleshoot job execution failure
* Resolve the security issue
* Perform further troubleshooting

After completing this module, students will be able to:

* Explain SQL Server Agent security.
* Configure credentials.
* Configure Proxy accounts.

**Module 15: Monitoring SQL Server 2012 with Alerts and Notifications**This module covers the configuration of database mail, alerts and notifications.**Lessons**

* Configuration of Database Mail
* Monitoring SQL Server Errors
* Configuring Operators, Alerts and Notifications

**Lab : Monitoring SQL Agent Jobs with Alerts and Notifications**

* Configure Database Mail
* Implement Notifications
* Implement Alerts

After completing this module, students will be able to:

* Configure database mail.
* Monitor SQL Server errors.
* Configure operators, alerts and notifications.

**Module 16: Performing Ongoing Database Maintenance**This module covers database maintenance plans.**Lessons**

* Ensuring Database Integrity
* Maintaining Indexes
* Automating Routine Database Maintenance

**Lab : Performing Ongoing Database Maintenance**

* Check database integrity using DBCC CHECKDB
* Correct index fragmentation
* Create a database maintenance plan
* Investigate table lock performance

After completing this module, students will be able to:

* Ensure database integrity.
* Maintain indexes.
* Automate routine database maintenance.

**Module 17: Tracing Access to SQL Server 2012**This module covers SQL Profiler and SQL Trace stored procedures.**Lessons**

* Capturing Activity using SQL Server Profiler
* Improving Performance with the Database Engine Tuning Advisor
* Working with Tracing Options

**Lab : Tracing Access to SQL Server 2012**

* Capture a trace using SQL Server Profiler
* Analyze a trace using Database Engine Tuning Advisor
* Configure SQL Trace

After completing this module, students will be able to:

* Capture activity using SQL Server Profiler and Extended Events Profiler.
* Improve performance with the Database Engine Tuning Advisor.
* Work with tracing options.

**Module 18: Monitoring SQL Server 2012**This module introduces DMVs and the configuration of data collection.**Lessons**

* Monitoring Activity
* Capturing and Managing Performance Data
* Analyzing Collected Performance Data

**Lab : Monitoring SQL Server 2012**

* Investigating DMVs
* Configure Management Data Warehouse
* Configure Instances for Data Collection
* Work with Data Collector Reports

After completing this module, students will be able to:

* Monitor current activity.
* Capture and manage performance data.
* Analyze collected performance data.

**Module 19: Managing Multiple Servers**This module covers Central Management Servers and Multi-Server queries, Virtualization of SQL Server and Data-Tier Applications.**Lessons**

* Working with Multiple Servers
* Virtualizing SQL Server
* Deploying and Upgrading Data-Tier Applications

**Lab : Managing Multiple Servers**

* Configure CMS and execute multi-server queries
* Deploy a data-tier application
* Register and extract a data-tier application
* Upgrade a data-tier application

After completing this module, students will be able to:

* Work with multiple servers.
* Describe options for virtualizing SQL Server.
* Deploy and upgrade Data-Tier Applications.

**Module 20: Troubleshooting Common SQL Server 2012 Administrative Issues**This module covers common issues that require troubleshooting and gives guidance on where to start looking for solutions.**Lessons**

* SQL Server Troubleshooting Methodology
* Resolving Service-related Issues
* Resolving Concurrency Issues
* Resolving Login and Connectivity Issues

**Lab : Troubleshooting Common Issues**

* Troubleshoot and resolve SQL Server administrative issues

After completing this module, students will be able to:

* Explain SQL Server troubleshooting methodology.
* Resolve service-related issues.
* Resolve concurrency issues.
* Resolve login and connectivity issues.

**Module 1: Introduction to Data Warehousing**

This module provides an introduction to the key components of a data warehousing solution and the high-level considerations you must take into account when starting a data warehousing project.

**Lessons**

* Overview of Data Warehousing
* Considerations for a Data Warehouse Solution

**Lab : Exploring a Data Warehousing Solution**

* Exploring data sources
* Exploring an ETL solution
* Exploring a data warehouse

After completing this module, students will be able to:

* Describe the key elements of a data warehousing solution.
* Describe the key considerations for a data warehousing project.

**Module 2: Data Warehouse Hardware**

This module describes the characteristics of typical data warehouse workloads, and explains how you can use reference architectures and data warehouse appliances to ensure you build the system that is right for your organization.

**Lessons**

* Considerations for Building a Data Warehouse
* Data Warehouse Reference Architectures and Appliances

After completing this module, students will be able to:

* 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.

**Module 3: Designing and Implementing a Data Warehouse**

In this module, you will learn how to implement the logical and physical architecture of a data warehouse based on industry-proven design principles.

**Lessons**

* Logical Design for a Data Warehouse
* Physical Design for a Data Warehouse

**Lab : Implementing a Data Warehouse Schema**

* Implementing a Star Schema
* Implementing a Snowflake Schema
* Implementing a Time Dimension Table

After completing this module, students will be able to:

* Implement a logical design for a data warehouse.
* Implement a physical design for a data warehouse.

**Module 4: Creating an ETL Solution with SSIS**

This module discusses considerations for implementing an ETL process, and then focuses on SQL Server Integration Services (SSIS) as a platform for building ETL solutions.

**Lessons**

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

**Lab : Implementing Data Flow in a SSIS Package**

* Exploring Source Data
* Transferring Data by Using a Data Flow Task
* Using Transformations in a Data Flow

After completing this module, students will be able to:

* Describe the key features of SSIS.
* Explore source data for an ETL solution.
* Implement a data flow using SSIS.

**Module 5: Implementing Control Flow in an SSIS Package**

Control flow in SQL Server Integration Services packages enables you to implement complex ETL solutions that combine multiple tasks and workflow logic. This module covers how to implement control flow, and design robust ETL processes for a data warehousing solution that coordinate data flow operations with other automated tasks.

**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 module, students will be able to:

* Implement control flow with tasks and precedence constraints.
* Create dynamic packages that include variables and parameters.
* Use containers in a package control flow.
* Enforce consistency with transactions and checkpoints.

**Module 6: Debugging and Troubleshooting SSIS Packages**

This module describes how you can debug SQL Server Integration Services (SSIS) packages to find the cause of errors that occur during execution. Then module then covers the logging functionality built into SSIS you can use to log events for troubleshooting purposes. Finally, the module describes common approaches for handling errors in control flow and data flow.

**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 a Data Flow

After completing this module, students will be able to:

* Debug an SSIS package.
* Implement logging for an SSIS package.
* Handle errors in an SSIS package.

**Module 7: Implementing an Incremental ETL Process**

This module describes the techniques you can use to implement an incremental data warehouse refresh process.

**Lessons**

* Introduction to Incremental ETL
* Extracting Modified Data
* Loading Modified Data

**Lab : Extracting Modified Data**

* Using a DateTime Column to Incrementally Extract Data
* Using a Change Data Capture
* Using Change Tracking

**Lab : Loading Incremental Changes**

* Using a Lookup Transformation to Insert Dimension Data
* Using a Lookup Transformation to Insert or Update Dimension Data
* Implementing a Slowly Changing Dimension
* Using a MERGE Statement to Load Fact Data

After completing this module, students will be able to:

* Describe the considerations for implementing an incremental extract, transform, and load (ETL) solution.
* Use multiple techniques to extract new and modified data from source systems.
* Use multiple techniques to insert new and modified data into a data warehouse.

**Module 8: Incorporating Data from the Cloud into a Data Warehouse**

In this module, you will learn about how you can use cloud computing in your data warehouse infrastructure and learn about the tools and services available from the Microsoft Azure Marketplace.

**Lessons**

* Overview of Cloud Data Sources
* SQL Server Database
* The Windows Azure Marketplace

**Lab : Using Cloud Data in a Data Warehouse Solution**

* Creating a SQL Azure Database
* Extracting Data from a SQL Azure Database
* Obtaining Data from the Windows Azure Marketplace

After completing this module, students will be able to:

* Describe cloud data scenarios.
* Describe SQL Azure.
* Describe the Windows Azure Marketplace.

**Module 9: Enforcing Data Quality**

Ensuring the high quality of data is essential if the results of data analysis are to be trusted. This module explains how to use the SQL Server 2012 Data Quality Services (DQS) to provide a computer assisted process for cleansing data values and identifying and removing duplicate data entities.

**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 : Deduplicating Data**

* Creating a Matching Policy
* Using a DQS Project to Match Data

After completing this module, students will be able to:

* Describe how Data Quality Services can help you manage data quality.
* Use Data Quality Services to cleanse your data.
* Use Data Quality Services to match data.

**Module 10: Using Master Data Services**

This module introduces Master Data Services and explains the benefits of using it in a data warehousing context. The module also describes the key configuration options for Master Data Services, and explains how to import and export data. Finally, the module explains how to apply rules that help to preserve data integrity, and introduces the new Master Data Services Add-in for Excel.

**Lessons**

* Introduction to Master Data Services
* Implementing a Master Data Services Model
* Using the Master Data Services Add-in for Excel

**Lab : Implementing Master Data Services**

* Creating a Basic Model
* Editing a Model by Using the Master Data Services Add-in for Excel
* Loading Data into a Model
* Enforcing Business Rules
* Consuming Master Data Services Data

After completing this module, students will be able to:

* Describe key Master Data Services concepts.
* Implement a Master Data Services model.
* Use the Master Data Services Add-in for Excel to view and modify a model.

**Module 11: Extending SQL Server Integration Services**

This module describes the techniques you can use to extend SQL Server Integration Services (SSIS). The module is not designed to be a comprehensive guide to developing custom SSIS solutions, but to provide an awareness of the fundamental steps required to use custom components and scripts in an ETL process that is based on SSIS.

**Lessons**

* Using Custom Components in SSIS
* Using Scripts in SSIS

**Lab : Using Custom Components and Scripts**

* Using a Custom Component
* Using a Script Task

After completing this module, students will be able to:

* Describe how custom components can be used to extend SSIS.
* Describe how you can include custom scripts in an SSIS package.

**Module 12: Deploying and Configuring SSIS Packages**

SQL Server Integration Services provides tools that make it easy to deploy packages to another computer. The deployment tools also manage any dependencies, such as configurations and files that the package needs. In this module, you will learn how to use these tools to install packages and their dependencies on a target computer.

**Lessons**

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

**Lab : Deploying and Configuring SSIS Packages**

* Create a SSIS Catalog
* Deploy an SSIS Project
* Create Environments for an SSIS Solution
* Running an SSIS Package in SQL Server Management Studio
* Scheduling SSIS Packages with SQL Server Agent

After completing this module, students will be able to:

* Describe SSIS deployment.
* Explain how to deploy SSIS projects using the project deployment model.
* Plan SSIS package execution.

**Module 13: Consuming Data in a Data Warehouse**

This module introduces Business Intelligence (BI), describes the components of SQL Server that you can use to create a BI solution, and the client tools that users can use to create reports and analyze data.

**Lessons**

* Introduction to Business Intelligence
* Introduction to Reporting
* Introduction to Data Analysis

**Lab : Using Business Intelligence Tools**

* Exploring a Reporting Services Report
* Exploring a PowerPivot Workbook
* Exploring a Power View Report

After completing this module, students will be able to:

* Describe BI and common BI scenarios.
* Explain the key features of SQL Server Reporting Services.
* Explain the key features of SQL Server Analysis Services.