HP Education Services

Developing Microsoft SQL Server 2012 Databases

This 5-day instructor-led course introduces SQL Server 2012 and describes logical table design, indexing and query plans. It also focusses on the creation of database objects including views, stored procedures, along with parameters, and functions. Other common aspects of procedure coding, such as transactions, concurrency, error handling, triggers, and SQL CLR are also covered in this course. Also this course helps you prepare for the Exam 70-464.

AUDIENCE

- The primary audience for this course is IT Professionals who want to become skilled on SQL Server 2012 product features and technologies for implementing a database.

Pre-Requisites

In addition to their professional experience, students who attend this training should have experience:

- Knowledge of writing T-SQL queries
- Knowledge of basic relational database concepts
- 10774A: Writing T-SQL Queries for Microsoft SQL Server 2012

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Course title:	Developing Microsoft SQL Server 2012 Databases
HP product number:	H3K44S
Category/Subcategory:	Microsoft
Course length:	5 days
Delivery language:	English

COURSE OUTLINE

Module 1: Introduction to SQL Server 2012 and its Toolset
This module stresses on the fact that before beginning to work with SQL Server in either a development or an administration role, it is important to understand the overall SQL Server platform. In particular, it is useful to understand that SQL Server is not just a database engine but it is a complete platform for managing enterprise data.
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 lesson, you will be able to:

Describe the SQL Server Platform
Work with SQL Server Tools
Configure SQL Server Services
Module 2: Working with Data Types
This module explains how to use and convert data types. Also it focusses on how to work with specialized data types, and character data types.
Lessons:

Using Data Types
Working with Character Data
Converting Data Types
Specialized Data Types
Lab: Working with Data Types

Choosing Appropriate Data Types
Writing Queries With Data Type Conversions
Designing and Creating Alias Data Types (Only if time permits)
After completing this module, students will be able to:

Work with data types
Work with character data
Convert between data types
Use specialized data types
Module 3: Designing and Implementing Tables
This module explains how to design, create, and alter tables. Also it focusses on working with schemas.
Lessons:

Designing Tables
Working with Schemas
Creating and Altering Tables
Lab: Designing and Implementing Tables

Improving the Design of Tables
Creating a Schema
Creating the Tables
After completing this module, students will be able to:

Design Tables
Work with Schemas
Create and Alter Tables
Module 4: Ensuring Data Integrity through Constraints
This module explains how to enforce data integrity, and implement domain integrity to maintain high quality data. Also it focuses on implementing Entity and Referential Integrity.
Lessons:

Enforcing Data Integrity
Implementing Domain Integrity
Implementing Entity and Referential Integrity
Lab: Ensuring Data Integrity through Constraints

Designing Constraints
Testing the constraints
After completing this module, students will be able to:

Explain the available options for enforcing data integrity and the levels at which they should be applied
Implement domain integrity
Implement entity and referential integrity
Module 5: Planning for SQL Server 2012 Indexing
This module explains the core indexing concepts and effectiveness of each data type commonly used in indexes.
Lessons:

Core Indexing Concepts
Data Types and Indexes
Single Column and Composite Indexes
Lab: Planning for SQL Server Indexing

Exploring existing index statistics
Designing column orders for indexes
After completing this module, students will be able to:

Explain core indexing concepts
Describe the effectiveness of each data type common used in indexes
Plan for single column and composite indexes
Module 6: Implementing Table Structures in SQL Server 2012
This module explains how tables can be structured in SQL Server databases. Also it focusses on designing and working with clustered indexes.
Lessons:

SQL Server Table Structures
Working with Clustered Indexes
Designing Effective Clustered Indexes
Lab: Implementing Table Structures in SQL Server

Creating Tables as Heaps
Creating Tables with Clustered Indexes
Comparing the Performance of Clustered Indexes vs. Heaps
After completing this module, students will be able to:

Explain how tables can be structured in SQL Server databases
Work with clustered indexes
Design effective clustered indexes
Module 7: Reading SQL Server 2012 Execution Plans
This module explains how to design additional indexes. Also it focusses on how to read and interpret execution plans.
Lessons:

Execution Plan Core Concepts
Common Execution Plan Elements
Working with Execution Plans
Lab: Reading SQL Server Execution Plans

Actual vs. Estimated Plans
Identifying Common Plan Elements
Querying Cost Comparison
After completing this module, students will be able to:

Explain the core concepts related to the use of execution plans
Describe the role of the most common execution plan elements
Work with execution plans

Module 8: Improving Performance through Nonclustered Indexes
This module explains how Nonclustered Indexes have the potential to significantly enhance the performance of applications and how to use a tool that can help design these indexes appropriately.
Lessons:

Designing Effective Nonclustered Indexes
Implementing Nonclustered Indexes
Using the Database Engine Tuning Advisor
Lab: Improving Performance through Nonclustered Indexes

Nonclustered index usage review
Improving Nonclustered index designs
Working with SQL Server Profiler and Database Engine Tuning Advisor
Designing Nonclustered Index
After completing this module, students will be able to:

Design Effective Nonclustered Indexes
Implement Nonclustered Indexes
Use the database engine tuning advisor to design indexes
Module 9: Designing and Implementing Views
This module introduces Views, and explains how to create and manage Views. Also it focuses on the performance consideration for Views.
Lessons:

Introduction to Views
Creating and Managing Views
Performance Considerations for Views
Lab: Designing and Implementing Views

Designing, Implementing and Testing the WebStock Views
Designing and Implementing the Contacts View
Modifying the AvailableModels View
After completing this module, students will be able to:

Explain the role of views in database development
Implement views
Describe the performance related impacts of views
Module 10: Designing and Implementing Stored Procedures
This module describes the potential advantages of the use of stored procedures along with guidelines on creating them.
Lessons:

Introduction to Stored Procedures
Working With Stored Procedures
Implementing Parameterized Stored Procedures
Controlling Execution Context
Lab: Designing and Implementing Stored Procedures

Creating stored procedures
Creating a parameterized stored procedure
Altering the execution context of stored procedures
After completing this module, students will be able to:

Describe the role of stored procedures and the potential benefits of using them
Work with stored procedures
Implement parameterized stored procedures
Control the execution context of a stored procedure
Module 11: Merging Data and Passing Tables
This module reviews the techniques that provide the ability to process sets of data rather than individual rows. Also it focuses on how these techniques can be used in combination with TABLE parameter types to minimize the number of required stored procedure calls in typical applications.
Lessons:

Using the MERGE Statement
Implementing Table Types
Using TABLE Types As Parameters
Lab: Passing Tables and Merging Data

Creating a Table Type
Using a Table Type Parameter
Using a Table Type with MERGE
After completing this module, students will be able to:

Use the MERGE statement
Implement table types
Use TABLE types as parameters
Module 12: Designing and Implementing User-Defined Functions
This module explains how to design and implement user-defined functions that enforce business rules or data consistency, and modify and maintain existing functions written by other developers.
Lessons:

Overview of Functions
Designing and Implementing Scalar Functions
Designing and Implementing Table-Valued Functions
Implementation Considerations for Functions
Alternatives to Functions
Lab: Designing and Implementing User-Defined Functions

Formatting Phone Numbers
Modifying an Existing Function
Resolve a Function-related Performance Issue
After completing this module, students will be able to:

Design and implement scalar functions
Design and implement table-valued functions
Describe implementation considerations for functions
Describe alternatives to functions
Module 13: Creating Highly Concurrent SQL Server 2012 Applications
This module explains how to use transactions and the SQL Server locking mechanisms to meet the performance and data integrity requirements of your applications.
Lessons:

Introduction to Transactions
Introduction to Locks
Management of Locking
Transaction Isolation Levels
Lab: Creating Highly Concurrent SQL Server Applications

Detecting Deadlockss

Investigating Transaction Isolation Levels
After completing this module, students will be able to:

Describe the role of transactions
Explain the role of locks
Manage locking
Work with transaction isolation level
Module 14: Handling Errors in T-SQL Code
This module explores T-SQL error handling, looks at how it has traditionally been implemented, and how structured exception handling can be used.
Lessons:

Understanding T-SQL Error Handling
Implementing T-SQL Error Handling
Implementing Structured Exception Handling
Lab: Handling Errors in T-SQL Code

Replacing @@ERROR based error handling with structured exception handling
Adding deadlock retry logic to the stored procedure
After completing this module, students will be able to:

Design T-SQL error handling
Implement T-SQL error handling
Implement structured exception handling

Module 15: Responding to Data Manipulation via Triggers
This module, explains what DML triggers are and how they enforce data integrity. Also it focuses on the different types of triggers available, and how to define triggers in a database.
Lessons:

Designing DML Triggers
Implementing DML Triggers
Advanced Trigger Concepts
Lab: Responding to Data Manipulation via Triggers

Creating and Testing the Audit Trigger
Improving the Audit Trigger
After completing this module, students will be able to:

Design DML triggers
Implement DML triggers
Explain advanced DML trigger concepts
Module 16: Implementing Managed Code in SQL Server 2012
This module explains how to use CLR integrated code to create user-defined database objects that are managed by the .NET Framework.
Lessons:

Introduction to SQL CLR Integration
Importing and Configuring Assemblies
Implementing SQL CLR Integration
Lab: Designing and Implementing Views

Assessing Proposed CLR Code
Implementing a CLR Assembly
Implementing a CLR User-defined Aggregate and CLR User-defined Data Type
After completing this module, students will be able to:

Explain the importance of SQL Server CLR Integration
Import and configure assemblies
Implement objects that have been created within .NET assemblies
Module 17: Storing XML Data in SQL Server 2012
This module introduces XML and shows how XML data can be stored within SQL Server.
Lessons:

Introduction to XML and XML Schemas
Storing XML Data and Schemas in SQL Server
Implementing the XML Data Type
Lab: Storing XML Data in SQL Server

Appropriate Usage of XML Data Storage in SQL Server
Investigating the Storage of XML Data in Variables
Investigating the use of XML Schema Collections
Investigating the Creation of Database Columns Based on XML
After completing this module, students will be able to:

Describe XML and XML schemas
Store XML data and associated XML schemas in SQL Server
Implement the XML data type within SQL Server
Module 18: Querying XML Data in SQL Server
This module shows how XML data can be queried, including queries written in a language called XQuery.
Lessons:

Using the T-SQL FOR XML Statement
Getting Started with XQuery
Shredding XML
Lab: Querying XML Data in SQL Server

Learning to query SQL Server data as XML
Writing a stored procedure returning XML
Writing a stored procedure that updates using XML
After completing this module, students will be able to:

Use the T-SQL FOR XML Statement
Work with basic XQuery queries
Shred XML to a relational form
Module 19: Working with SQL Server 2012 Spatial Data
This module introduces Spatial Data, and explains how to work with SQL Server Spatial Data Types.
Lessons:

Introduction to Spatial Data
Working with SQL Server Spatial Data Types
Using Spatial Data in Applications
Lab: Working with SQL Server Spatial Data

Familiarity with Geometry Data Type
Adding Spatial Data to an Existing Table
Business Application of Spatial Data
After completing this module, students will be able to:

Describe the importance of spatial data and the industry standards related to it
Explain how to store spatial data in SQL Server
Perform calculations on and query SQL Server spatial data
Module 20: Working with Full-Text Indexes and Queries
This module introduces Full-Text Indexing and how to implement Full-Text Indexes in SQL Server.
Lessons:

Introduction to Full-Text Indexing
Implementing Full-Text Indexes in SQL Server
Working with Full-Text Queries
Lab: Working with Full-Text Indexes and Queries

Implementing a full-text index
Implementing a stoplist
Creating a stored procedure to implement a full-text search
After completing this module, students will be able to:

Describe why user interfaces in existing applications are not sufficient for end user search needs
Implement full-text indexes in SQL Server
Query SQL Server using full-text queries

For more information

To locate contact information and to learn more about education services, please visit our web site at **http://www.hp.com.au/education .**