20761: Querying Data with Transact-SQL (SQL Server 2017)

Course Details

Course Outline

1. **Introduction to Microsoft SQL Server**
   - The Basic Architecture of SQL Server
   - SQL Server Editions and Versions
   - Getting Started with SQL Server Management Studio
   - o **Lab : Working with SQL Server Tools**
   - Working with SQL Server Management Studio
   - Creating and Organizing T-SQL Scripts
   - Using Books Online

2. **Introduction to T-SQL Querying**
   - Introducing T-SQL
   - Understanding Sets
   - Understanding Predicate Logic
   - Understanding the Logical Order of Operations in SELECT statements
   - o **Lab : Introduction to T-SQL Querying**
   - Executing Basic SELECT Statements
   - Executing Queries that Filter Data using Predicates
   - Executing Queries That Sort Data Using ORDER BY

3. **Writing SELECT Queries**
   - Writing Simple SELECT Statements
   - Eliminating Duplicates with DISTINCT
   - Using Column and Table Aliases
   - Writing Simple CASE Expressions
   - o **Lab : Writing Basic SELECT Statements**
   - Writing Simple SELECT Statements
   - Eliminating Duplicates Using DISTINCT
   - Using Column and Table Aliases
   - Using a Simple CASE Expression

4. **Querying Multiple Tables**

- Understanding Joins
- Querying with Inner Joins
- Querying with Outer Joins
- Querying with Cross Joins and Self Joins
- o **Lab : Querying Multiple Tables**
- Writing Queries that use Inner Joins
- Writing Queries that use Multiple-Table Inner Joins
- Writing Queries that use Self-Joins
- Writing Queries that use Outer Joins
- Writing Queries that use Cross Joins

5. **Sorting and Filtering Data**

- Sorting Data
- Filtering Data with Predicates
- Filtering Data with TOP and OFFSET-FETCH
- Working with Unknown Values
- o **Lab : Sorting and Filtering Data**
- Writing Queries that Filter Data using a WHERE Clause
- Writing Queries that Sort Data Using an ORDER BY Clause
- Writing Queries that Filter Data Using the TOP Option
- Write Queries that filter data using the OFFSET-FETCH clause

6. **Working with SQL Server Data Types**

- Introducing SQL Server Data Types
- Working with Character Data
- Working with Date and Time Data
- o **Lab : Working with SQL Server 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 Return Character Functions

7. **Using DML to Modify Data**

- Adding Data to Tables

- Modifying and Removing Data
- Generating automatic column values
  - o **Lab : Using DML to Modify Data**
- Inserting Records with DML
- Updating and Deleting Records Using DML

8. **Using Built-In Functions**
   - Writing Queries with Built-In Functions
   - Using Conversion Functions
   - Using Logical Functions
   - Using Functions to Work with NULL
     - o **Lab : Using Built-In Functions**
   - Writing Queries That Use Conversion Functions
   - Writing Queries that use Logical Functions
   - Writing Queries that Test for Nullability

9. **Grouping and Aggregating Data**
   - Using Aggregate Functions
   - Using the GROUP BY Clause
   - Filtering Groups with HAVING
     - o **Lab : Grouping and Aggregating Data**
   - Writing Queries That Use the GROUP BY Clause
   - Writing Queries that Use Aggregate Functions
   - Writing Queries that Use Distinct Aggregate Functions
   - Writing Queries that Filter Groups with the HAVING Clause

10. **Using Subqueries**
    - Writing Self-Contained Subqueries
    - Writing Correlated Subqueries
    - Using the EXISTS Predicate with Subqueries
      - o **Lab : Using Subqueries**
    - Writing Queries That Use Self-Contained Subqueries
    - Writing Queries That Use Scalar and Multi-Result Subqueries
    - Writing Queries That Use Correlated Subqueries and an EXISTS Clause

11. Using Table Expressions

- Using Views
- Using Inline Table-Valued Functions
- Using Derived Tables
- Using Common Table Expressions
- o **Lab : Using Table Expressions**
- Writing Queries That Use Views
- Writing Queries That Use Derived Tables
- Writing Queries That Use Common Table Expressions (CTEs)
- Writing Queries That Use Inline Table-Valued Expressions (TVFs)

12. Using Set Operators

- Writing Queries with the UNION operator
- Using EXCEPT and INTERSECT
- Using APPLY
- o **Lab : Using Set Operators**
- Writing Queries That Use UNION Set Operators and UNION ALL
- Writing Queries That Use CROSS APPLY and OUTER APPLY Operators
- Writing Queries That Use the EXCEPT and INTERSECT Operators

13. Using Windows Ranking, Offset, and Aggregate Functions

- Creating Windows with OVER
- Exploring Window Functions
- o **Lab : Using Windows Ranking, Offset, and Aggregate Functions**
- Writing Queries that use Ranking Functions
- Writing Queries that use Offset Functions
- Writing Queries that use Window Aggregate Functions

14. Pivoting and Grouping Sets

- Writing Queries with PIVOT and UNPIVOT
- Working with Grouping Sets
- o **Lab : Pivoting and Grouping Sets**
- Writing Queries that use the PIVOT Operator
- Writing Queries that use the UNPIVOT Operator
- Writing Queries that use the GROUPING SETS CUBE and ROLLUP Subclauses

15. Executing Stored Procedures

- Querying Data with Stored Procedures
- Passing Parameters to Stored procedures
- Creating Simple Stored Procedures
- Working with Dynamic SQL
- o **Lab : Executing Stored Procedures**
- Using the EXECUTE statement to Invoke Stored Procedures
- Passing Parameters to Stored procedures
- Executing System Stored Procedures

16. Programming with T-SQL

- T-SQL Programming Elements
- Controlling Program Flow
- o **Lab : Programming with T-SQL**
- Declaring Variables and Delimiting Batches
- Using Control-Of-Flow Elements
- Using Variables in a Dynamic SQL Statement
- Using Synonyms

17. Implementing Error Handling

- Implementing T-SQL error handling
- Implementing structured exception handling
- o **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:
- Implement T-SQL error handling.
- Implement structured exception handling.

18. Implementing Transactions

- Transactions and the database engines
- Controlling transactions
- o **Lab : Implementing Transactions**
- Controlling transactions with BEGIN, COMMIT, and ROLLBACK
- Adding error handling to a CATCH block