

# SQL Intermediate

## Course Overview – 1-day course

A crucial skill for anyone working with data is the ability to access and analyse that data. Structured Query Language (SQL) enables users to access data from databases, combine data from multiple, related tables and to aggregate, sort, filter or limit the data retrieved as needed.

In this course, participants will move beyond using basic SELECT clauses for retrieving data. Learn to work with many different types of functions and expressions that modify the way data are returned in the result set. Students will use built-in T-SQL functions for working with string, date and numeric data types and will calculate moving averages, running totals and percentages using window functions.

Participants will learn to use subqueries to perform more complex queries and how to create and use views to simplify querying. Students will also create their own user-defined functions to encapsulate business logic and improve efficiency.

In this course, students work with an Azure SQL database and write queries in Microsoft's Transact-SQL (T-SQL). Much of what is covered will be useful for users working with other database products.

## Detailed Content

### Introduction

SQL and T-SQL

### Data Types

Conversion between data types  
CAST, CONVERT and PARSE

### Functions in T-SQL

Built-in Functions  
Aggregate Functions  
Scalar Functions  
Ranking Functions  
User-defined functions

### Aggregate Functions and Group By Extensions

GROUP BY CUBE, ROLLUP  
and GROUPING SETS  
CASE and CASE alternatives  
COALESCE  
NULLIF

### String Functions

Concatenate, replace and  
format

### Date and Time Functions

Get today's date

Calculate date/time differences  
Calculate a new date  
Extracting date components  
Creating dates

### Logical Functions

IIF  
CHOOSE  
GREATEST and LEAST

### Mathematical Functions

ROUND, CEILING and FLOOR

### Writing More Complex Queries

Subqueries  
Views

### Window Functions

OVER clause  
PARTITION BY  
ORDER BY  
ROWS or RANGE  
Calculate percentages, moving  
averages and running totals  
LAG and LEAD  
FIRST\_VALUE, LAST\_VALUE

### Ranking Functions

ROW\_NUMBER  
RANK and DENSE RANK  
NTILE

### User-Defined Functions

Scalar user-defined functions  
Schemas  
Local variables  
Control-of-flow statements

### Query Performance

Improving query performance