# 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 group averages and totals, 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
NULLIFF

### 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
Local Variables
Views

### Window (Analytic) Functions
OVER clause
PARTITION BY
ORDER BY
ROWS or RANGE

Calculate group totals, averages percentages and running totals
LAG and LEAD
FIRST_VALUE, LAST_VALUE

### Ranking Functions
ROW_NUMBER
RANK and DENSE RANK
NTILE

### User-Defined Functions
Create, use and modify scalar user-defined functions
Schemas