# Introduction to SQL (2 Days)

**OVERVIEW**

This course provides a comprehensive introduction to relational database development and SQL, making it ideal for anyone looking to build a strong foundation in database management. Whether you are new to databases or seeking to solidify your understanding of SQL, this course will guide you through the fundamental concepts and practical techniques necessary to work with relational databases effectively.

The course begins with an overview of relational database basics, including a brief history of SQL and the principles underlying relational databases. You will learn about the core components of a relational database, such as tables, rows, columns, and relationships, as well as essential concepts like data types, primary keys, and foreign keys. This section also covers popular commercial and open-source databases, giving you a broad perspective on the database landscape.

As you progress, you will delve into the basics of SQL, starting with simple SELECT statements. You will learn how to retrieve data from a database, sort records, and filter results using the WHERE clause. The course also covers logical operators and introduces the concept of checking for NULL values. Practical exercises are included throughout, allowing you to apply these concepts in real-world scenarios.

Moving into more advanced topics, the course explores calculated fields, aggregate functions, and grouping data. You will learn how to create complex queries that manipulate data, perform calculations, and group results. The course also introduces built-in data manipulation functions, which are essential for performing operations on strings, numbers, and dates.

The course further extends your SQL skills with lessons on subqueries, joins, and unions. You will learn how to combine data from multiple tables, perform outer joins, and use unions to merge results from different queries. This section is crucial for understanding how to work with complex data sets and relational data structures.

Conditional processing using the CASE statement is also covered, enabling you to add logic to your SQL queries. This feature is particularly useful for creating dynamic reports and handling various data conditions.

If time allows, the course concludes with an introduction to inserting, updating, and deleting records, giving you a full spectrum of SQL capabilities needed for managing data in a relational database.

By the end of this course, you will have a solid understanding of relational databases and SQL, empowering you to build, query, and manage databases effectively. This knowledge will provide a strong foundation for further studies in database development or for applying SQL in real-world applications.

# Course Outline

**Relational Database Basics**
    Brief History of SQL
    Relational Databases
    Tables
    Popular Databases
    SQL Statements

**Simple SELECTs**
    Introduction to the Northwind Database
    Some Basics
    SELECTing All Columns in All Rows
    SELECTing Specific Columns
    Sorting Records
    The WHERE Clause and Logical Operator Symbols
    Checking for Greater or Less Than
    Checking for NULL
    WHERE and ORDER BY
    Checking Multiple Conditions with Boolean Operators
    The WHERE Clause and Logical Operator Keywords

**Advanced SELECTs**
    Calculated Fields
    Aggregate Functions and Grouping
    Selecting Distinct Records
    Built-in Data Manipulation Functions

**Subqueries, Joins and Unions**
    Subqueries
    Joins
    Table Aliases
    Multi-table Joins
    Outer Joins
    Unions
    UNION ALL
    UNION Rules

**Conditional Processing with CASE**
    Using CASE
    Exercise: Working with CASE

**Inserting, Updating and Deleting Records (if time allows)**
    Inserting Records
    Updating and Deleting Records

**Class Materials**
Each student will receive a comprehensive set of materials, including course notes and all the class examples.

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