# 55315: Introduction to SQL Databases (3 Days)

**Course Overview**

This course provides a comprehensive introduction to databases, focusing on relational database concepts, data modeling, and performance optimization. Designed for data professionals and anyone interested in understanding database fundamentals, this course covers essential topics such as database design, normalization, relationships, and key performance considerations, equipping you with the skills needed to effectively manage and optimize databases.

The course begins with an **Introduction to Databases**, where you'll explore the basics of relational databases, other types of databases and storage options, and the role of data analysis. This section also introduces SQL Server database languages, providing a foundational understanding of how databases work and their significance in data management and analysis.

Next, in the **Data Modeling** module, you'll learn about data modeling principles, designing databases, and modeling relationships. You'll gain insights into creating effective data models that represent real-world scenarios, which is crucial for designing robust and scalable databases that meet business needs.

The **Normalization** section covers the fundamentals of normalization, exploring normal forms and the process of organizing data within a database to reduce redundancy and improve integrity. You'll also learn about denormalization, understanding when and how to strategically implement it to optimize performance.

In the **Relationships** module, you'll delve into the concepts of database relationships and the importance of planning referential integrity. This section focuses on creating and managing relationships between tables, which is essential for maintaining data consistency and supporting complex queries.

The **Performance** module emphasizes key factors that impact database performance, including indexing, query optimization, and concurrency management. You'll learn how to create indexes to speed up data retrieval, analyze query performance, and manage concurrency to ensure efficient database operation in multi-user environments.

The course concludes with the **Database Objects** section, where you'll explore the creation and management of core database objects, including tables, views, stored procedures, triggers, and functions. You'll learn how these objects interact within a database, supporting efficient data management, access, and manipulation.

## Course Benefits

- Describe key database concepts in the context of SQL Server
- Describe database languages used in SQL Server
- Describe data modeling techniques
- Describe normalization and denormalization techniques
- Describe relationship types and effects in database design
- Describe the effects of database design on performance
- Describe commonly used database objects

## Course Outline

**Introduction to databases**

- Introduction to Relational Databases
- Other Databases and Storage
- Data Analysis
- SQL Server Database Languages

**Data Modeling**

- Data Modelling
- Designing a Database
- Relationship Modeling

**Normalization**

- Fundamentals of Normalization
- Normal Form
- Denormalization

**Relationships**

- Introduction to Relationships
- Planning Referential Integrity

**Performance**

- Indexing
- Query Performance
- Concurrency

**Database Objects**

- Tables
- Views
- Stored Procedures, Triggers and Functions