# SQL Server 2014, Part 4 of 9: Designing and Creating a Database



**Meet the expert:** Don Kiely is a featured instructor on many of our SQL Server and Visual Studio courses. He is a nationally recognized author, instructor, and consultant specializing in Microsoft technologies. Don has many years of teaching experience, is the author or co-author of several programming books, and has spoken at many industry conferences and user groups. In addition, Don is a consultant for a variety of companies that develop distributed applications for public and private organizations.

**Prerequisites:** The users should have a working knowledge of the Microsoft OS, Visual Studio and Server environment. This course assumes that you have at least a basic familiarity with the concept of relational databases and a basic understanding of what SQL Server is and the high-level tools in it.

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**Course description:** Creating a database is not just inputting data into a computer and expecting a database to appear. This course will teach you the basics of relational database design principles. You will then see how to create a SQL Server database based on sound design principles. Then see how to build tables using the SQL Server Management Studio designers. You will learn about SQL Server data types, how to create constraints, triggers, and indexes. Then to finish up create a database diagram and define relationships to enforce referential integrity.

**Course outline:**

**Database Design Principles**
- Introduction
- Database Design Principles
- Origins of Relational Design
- Key Terms
- Relational Theory
- Surrogate Keys
- Demo: Sample Database
- Data Normalization
- First Normal Form
- Demo: First Normal Form
- Demo: Repeating Groups
- Second Normal Form
- Demo: Second Normal Form
- Third Normal Form
- Demo: Third Normal Form
- Beyond Codd's Normal Forms
- Summary

**Referential Integrity**
- Introduction
- Referential Integrity
- One-to-Many Relationships
- Many-to-Many Relationships
- One-to-One Relationships
- Enforcing
- Cascading Updates and Deletes
- Cascading Updates
- Cascading Deletes
- Cascading Actions
- Beyond Normalization
- Enforcing Business Rules
- Summary

**Implementing Database Design**
- Introduction
- Database Storage
- Data Integrity
- Recovery Models
- Creating Databases
- Demo: Creating Database
- Demo: Database Options
- Demo: File Groups
- Rules for Identifiers
- Modifying Database Options
- Demo: Changing DB Options
- Demo: Retrieve a Value
- Creating Tables
- Summary

**Data Types**
- Introduction
- SQL Server Data Types
- Data Types - Numeric
- Data Types - Fractional
- Data Types - Date and Time
- Data Types - Date
- Data Types - Binary
- Data Types - Identifier
- Data Types - sql_variant
- Data Types - Variable only
- Data Types - XML
- Data Types - SQLCLR
- Data Types - User-Defined
- Demo: Data Types
- Demo: Create Columns
- Summary

**Columns and Constraints**
- Introduction
- Demo: Computed Column
- Demo: Saving Tables
- Creating Constraints
- Default Constraints
- Demo: Default Constraints
- Check Constraints
- Demo: Check Constraints
- Demo: Change Script
- Demo: Run Constraint
- Demo: Constraints on Columns
- Summary

**Indexes And Database Diagrams**
- Introduction
- Triggers
- Creating Indexes
- Demo: Creating Indexes
- Demo: Index Options
- Using Database Diagrams
- Demo: Database Diagrams
- Demo: Diagram
- Demo: Create Relationships
- Demo: Right Click Options
- Summary