

**Google BigQuery SQL**

**Course Number:** SQL-702  
**Duration:** 3 days

**Overview**

This live, instructor-led Google BigQuery SQL training course teaches attendees basic and advanced SQL for querying the Google BigQuery cloud data warehouse.

**Prerequisites**

No prior experience is presumed.

**Materials**

All Google BigQuery SQL training students receive comprehensive courseware.

**Software Needed on Each Student PC**

Internet access via Chrome is required to access the remote environment used for this training.

**Objectives**

* Basic SQL functions
* The WHERE clause
* Distinct and Group By
* Aggregation
* Joins
* Date and time functions
* Format functions
* Analytics and window functions
* Temporary tables
* Subqueries
* Strings
* Data interrogating
* Views
* Set operators
* Table creation
* Data Manipulation Language (DML)
* Math functions
* Statistical aggregate functions

**Outline**

* Introduction
* The Fundamentals of SQL
  + SELECT \* Returns All Columns from the Table
  + SELECT Specific Columns in a Table
  + Commas in the Front or Back?
  + ORDER BY
  + Nulls
  + Major Sort vs. Minor Sort
  + Multiple Sort Keys using Names vs. Numbers
  + You can ORDER BY using a Mix of names and Numbers
  + Sorts are Alphabetical, NOT Logical
  + Using A Valued CASE Statement to Sort Logically
  + Using A Searched CASE Statement to Sort Logically
  + How to ALIAS a Column Name
  + How to Get Capital Letters in a Report Header
  + Using Spaces in an ALIAS Clauses Errors
  + Using an Alias in the WHERE and ORDER BY Clause
  + A Missing Comma can become an Alias by Mistake
  + Limit and Offset
  + Comments
  + Move Data to the Google BigQuery Effortlessly
* The WHERE Clause
  + The WHERE Clause limits Returning Rows
  + Single-Quotes or Double-Quotes Are Used for Character Data
  + Reminder: Using Spaces in an ALIAS Clauses Errors
  + Using a Column ALIAS in the WHERE Clause
  + Numbers Do Not Need Single Quotes
  + Searching for null Values Using Equality Returns Nothing
  + Use IS NULL to Check for Null Values
  + Use IS NOT NULL for Interrogating NULL Values
  + Using Greater Than Or Equal To (>=)
  + AND in the WHERE Clause
  + Troubleshooting
    - Troubleshooting AND
    - OR in the WHERE Clause
    - Troubleshooting OR
    - Why OR Must Utilize the Column Name Each Time
    - Troubleshooting Character Data
    - Troubleshooting Character Data Continued
  + What is the Order of Precedence?
  + Using Parentheses to change the Order of Precedence
  + Using an IN List in Place of OR
  + The BETWEEN STatement
  + LIKE
* Distinct Vs. Group By
  + The Distinct Command
  + Distinct vs. GROUP BY
* Aggregation
  + There are Five Aggregates
  + Casting a Data Type
  + Troubleshooting Aggregates
  + GROUP BY when Aggregates and Normal Columns Mix
  + GROUP BY Delivers One Row Per Group
  + GROUP BY dept\_no or GROUP BY 1 the same thing
  + Limiting Rows and Improving Performance with WHERE
  + WHERE Clause in Aggregation limits unneeded Calculations
  + Keyword HAVING tests Aggregates after they are Totaled
* Joining Tables
  + NexusCore Servers - Control Network and Data Movement
  + A Two-Table Join Using Traditional Syntax
  + A two-table join using Non-ANSI Syntax with Table Alias
  + You Can Fully Qualify All Columns
  + A two-table join using ANSI Syntax
  + Both Queries have the same Results and Performance
  + Left Outer Join
  + Left Outer Join Results
  + Right Outer Join
  + Right Outer Join Example and Results
  + Full Outer Join
  + Full Outer Join Results
  + Which Tables are Left, and Which are the Right?
  + INNER JOIN with Additional AND Clause
  + ANSI INNER JOIN with Additional AND Clause
  + ANSI INNER JOIN with Additional WHERE Clause
  + OUTER JOIN with Additional WHERE Clause
  + OUTER JOIN with Additional AND Clause
  + The DREADED Product Join
  + The DREADED Product Join Results
  + Cartesian Product Join with Traditional Syntax
  + Cartesian Product Join with ANSI Syntax
  + The CROSS JOIN
  + The Self  Join
  + The Self  Join with ANSI Syntax
  + An Associative Table is a Bridge that Joins Two Tables
  + The Five-Table Join – Logical Insurance Model
* Date and Time
  + The Google BigQuery Tree of Nexus
  + Current\_Date
  + Current\_Date and Current\_Timestamp
  + Add or Subtract From a Date
  + Add or Subtract Days From a Date
  + DATE
  + TIME
  + Support Elements for DATE Formatting
  + The EXTRACT Command
  + EXTRACT from DATES and TIME
  + Extract Options
  + Extract Time and Timestamp
  + STRING Timestamp
  + Another Datediff Example
  + DATE\_TRUNC
  + TIME\_TRUNC
  + TIMESTAMP\_TRUNC
  + LAST\_DAY
  + DATE\_ADD
  + TIME\_ADD
  + TIMESTAMP\_ADD
  + DATE\_SUB
  + TIME\_SUB
  + TIMESTAMP\_SUB
  + Clever Tricks for Month
  + Determining if the Current\_Date is a Leap Year
  + Determining if the Current\_Timestamp is a Leap Year
* Analytics
  + The Nexus Super Join Builder builds SQL Automatically
  + Row\_Number
  + Find the Top Two Students Per class\_code
  + RANK
  + Cumulative Sum
  + Reset with a PARTITION BY Statement
  + Totals and Subtotals through Partition By
  + Moving Sum
  + Partition By Resets the Calculation
  + Moving Average
  + The Partition By Statement
  + Partition By Resets an ANSI OLAP
  + Moving Difference
  + Finding a Value of a Column in the Next Row with MIN
  + Finding a Next Row Value with MIN and PARTITION BY
  + Finding The Next Date using MAX
  + Finding Multiple Values of a Column in Upcoming Rows
  + COUNT OVER
  + MAX OVER and MIN OVER
  + Different Windowing Options
  + How Ntile Works
  + Using Quantiles (Partitions of Four)
  + NTILE With a Partition
  + NTILE With a Partition and a Derived Table
  + Using FIRST\_VALUE
  + Last\_Value
  + Using LEAD With an Offset of 2 and a PARTITION
  + Using LAG
  + CUME\_DIST
  + CURRENT ROW AND UNBOUNDED FOLLOWING
  + Different Windowing Options
  + ANY\_VALUE
* Temporary Tables
  + Move an Entire Database to Google BigQuery
  + CREATING A Derived Table
  + Naming the Derived Table
  + CREATING A Derived Table using the WITH Command
  + Derived Query Examples with Two Different Techniques
  + Most Derived Tables Are Used To Join To Other Tables
  + The Three Components of a Derived Table
  + Visualize This Derived Table
  + Our Join Example Using The WITH Syntax
  + An Example of Two Derived Tables in a Single Query
  + An Example of Two Derived Tables Using WITH
  + Select Expressions
  + Select Expression Using UNION ALL
  + Another Select Expression Using UNION ALL
* Subqueries
  + The Nexus Migrates Data To and From Every System
  + An IN List is much like a Subquery
  + An IN List Never has Duplicates – Just like a Subquery
  + An IN List Ignores Duplicates
  + The Subquery
  + The Three Steps of How a Basic Subquery Works
  + These are Equivalent Queries
  + The Final Answer Set from the Subquery
  + Should you use a Subquery or a Join?
  + The Basics of a Correlated Subquery
  + The Top Query always runs first in a Correlated Subquery
  + Correlated Subquery Example vs. a Join with a Derived Table
  + NOT IN Subquery Returns Nothing when Nulls are Present
  + Fixing a NOT IN Subquery with Null Values
  + Using a Correlated Exists
  + How a Correlated Exists Matches Up
  + The Correlated NOT Exists
* Strings
  + Nexus Pivots Your Answer Sets
  + UPPER and lower  Functions
  + The Length Command Counts Characters
  + The Char\_Length Command Counts Characters
  + The TRIM Command trims both Leading and Trailing Spaces
  + The RTRIM and LTRIM Command Trims Spaces
  + Concatenation
  + The SUBSTR and SUBSTRING Commands
  + The STRPOS Command finds a Letters Position
  + LPAD and RPAD
  + The REPLACE Function
  + The STARTS\_WITH Function
  + The ENDS\_WITH Function
  + Initcap Function
  + Repeat Function
  + SPLIT Function
  + TRANSLATE Function
  + The ASCII Function
  + The UNICODE Function
  + The Reverse String Function
  + The RIGHT Function
  + The LEFT and RIGHT Functions
  + SOUNDEX Function to Find a Sound
  + Java Script Object Notation (JSON)
  + Regex
  + The REPLACE Function
* Interrogating the Data
  + Drag an Answer Set to Any System to Create a Table
  + IFNULL
  + The COALESCE Command
  + COALESCE is Equivalent to this CASE Statement
  + IF
  + Valued Case vs. Searched Case
  + Combining Searched Case and Valued Case
  + A Trick for getting a Horizontal Case
  + Put a Valued CASE in the ORDER BY
  + Put a Searched CASE in the ORDER BY
* Views
  + Join Excel with Production Tables
  + The Fundamentals of Views
  + Creating a Simple View to Restrict Sensitive Columns
  + Creating a Simple View to Restrict Rows
  + Creating a View to Join Tables Together
  + Basic Rules for Views
  + How to Modify a View
  + The Exception to the ORDER BY Rule inside a View
  + Derived Columns in a View Should Contain a Column Alias
  + The Standard Way Most Aliasing is Done
* Set Operators
  + When the Desktop and the Server Work as One
  + Set Operators
  + Rule 1: Equal Number of Columns in both SELECT Lists
  + Rule 2: Top Query is Responsible for all Aliasing
  + Rule 3: Bottom Query does the ORDER BY Statement
  + Intersect Challenge
  + Using UNION ALL and Literals
  + Great Trick:  Place your Set Operator in a Derived Table
  + A Great Example of how EXCEPT works
  + Changing the Order of Precedence with Parentheses
* Creating Tables
  + Google BigQuery Data Types (1 of 3)
  + Google BigQuery Data Types (2 of 3)
  + Google BigQuery Data Types (3 of 3)
  + Creating a Basic Table
  + IF NOT EXISTS
  + CREATE OR REPLACE
  + Float64 vs. Numeric
  + Partitioned Table Options
  + Date Partitioned Table
  + Timestamp Partitioned Table by Hour
  + Timestamp Partitioned Table by Day
  + Timestamp Partitioned Table by Month
  + Timestamp Partitioned Table by Year
  + Timestamp Partitioned Table by Integer
  + Table Clustering
* Data Manipulation Language (DML)
  + INSERT Syntax # 1
  + INSERT Syntax # 2
  + INSERT Example with Multiple Rows
  + Inserting Null Values into a Table
  + INSERT/SELECT Command
  + INSERT/SELECT to Build a Data Mart
  + UPDATE Examples
  + Deleting Rows in a Table
* Statistical Aggregate Functions
  + The Stats Table
  + The STDDEV\_POP Function
  + STDDEV
  + The STDDEV\_SAMP Function
  + The VAR\_POP Function
  + The VAR\_SAMP Function
  + Variance
  + The CORR Function
  + The COVAR\_POP Function
  + The COVAR\_SAMP Function
  + ARRAY\_AGG
  + ARRAY\_AGG Examples
  + More ARRAY\_AGG Examples
  + APPROX\_COUNT\_DISTINCT
* Mathematical Functions
  + Example Mathematical Functions
  + Numeric Manipulation Functions
  + ABS
  + ACOS
  + ASIN
  + Ceiling
  + Floor
  + COS
  + DIV
  + EXP
  + LN
  + LOG
  + MOD
  + POWER
  + ROUND
  + SIGN
  + SIN
  + SQRT
  + TRUNC
* Conclusion