

## IBM Mastering Flink SQL on Confluent Cloud - Extended

**Duration: 3 Days**    **Course Code: FLINKCC2G**    **Delivery Method: Virtual Classroom**

### Overview:

**Learn how to develop and optimize real-time data streaming solutions using Flink SQL on Confluent Cloud, including aggregations, joins, event pattern detection, and advanced state management.**

This intensive, three-day course provides in-depth training on building end-to-end, real-time streaming pipelines using Flink SQL on Confluent Cloud. Participants transition from basic stream processing concepts to advanced streaming architecture, gaining practical experience in creating high-throughput, low-latency analytics pipelines.

Throughout the course, hands-on exercises reinforce the topics being discussed. Exercises include: Setting up Flink SQL on Confluent Cloud Writing and managing Flink SQL queries Creating dynamic tables and comparing change log modes Implementing time windows and watermarks Performing aggregations in a practical use case Exploring joins (regular, interval, temporal, windowed) Pattern matching to detect complex event sequences Implementing and deploying Java UDFs Working with advanced statement patterns

**NB:** This course includes the content of MASTERFLINKG

*Updated Sept 2026*

### Virtual Learning

This interactive training can be taken from any location, your office or home and is delivered by a trainer. This training does not have any delegates in the class with the instructor, since all delegates are virtually connected. Virtual delegates do not travel to this course, Global Knowledge will send you all the information needed before the start of the course and you can test the logins.

### Target Audience:

This course is designed for SQL practitioners who want to extend their skills to stream processing using Flink SQL on Confluent Cloud. It is ideal for data engineers, analysts, and developers who are familiar with SQL and need to apply it to real-time data streams.

### Objectives:

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| <ul style="list-style-type: none"> <li>■ <b>After this course participants should be able to:</b></li> <li>■ Build real-time streaming pipelines using Flink SQL</li> <li>■ Work with dynamic tables and understand stream-table duality</li> <li>■ Master time windows, watermarks, and event-time processing</li> <li>■ Perform windowed aggregations and analytics on live data streams</li> </ul> | <ul style="list-style-type: none"> <li>■ Join, enrich, and correlate data across multiple streaming sources</li> <li>■ Detect complex event patterns in real-time</li> <li>■ Extend Flink SQL capabilities with custom UDFs</li> <li>■ Use advanced patterns such as Statement Sets, Snapshots, EOS, and State Management</li> <li>■ Connect Flink SQL to external databases and AI/ML services</li> </ul> |
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### Prerequisites:

This course is recommended for participants who have familiarity with SQL syntax and operations and have a basic understanding of Kafka (topics & partitions) and stream processing.

Participants are required to provide a laptop computer with unobstructed internet access to fully participate in the class.

### Testing and Certification

None

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## Follow-on-Courses:

None

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## Content:

### Module 01: Introduction to Flink

- Lab 01: Setting up the Lab Environment
- Origin of Stream Processing
- What is Apache Flink-
- Apache Flink's APIs
- Flink Job ; Topology

### Module 02: Getting Started with Flink SQL

- Lab 02: Working with Flink in Confluent Cloud
- Why Flink SQL for Stream Processing-
- Flink SQL Syntax
- Streaming vs. Batch Processing
- Stateless vs. Stateful Operators
- Flink SQL on Confluent Cloud

### Module 03: Working with Dynamic Tables

- Lab 03: Working with Dynamic Tables
- Traditional SQL vs. Streaming SQL
- Stream-Table Duality
- Dynamic Table Creation
- Table Configuration ; Patterns
- Column Types
- Processing Schema-less Events
- Scan Modes

### Module 04: Time ; Windows

- Lab 04: Using Watermarks and Windows
- Event Time vs. Processing Time
- Time Attributes vs. Timestamps
- Watermarks
- Windows
- Time Functions ; Data Types

### Module 05: Aggregations

- Lab 05: Using Aggregations in a Practical Use Case
- Overview
- GROUP BY vs. OVER
- Aggregate Functions
- Special Aggregation Queries
- Additional Aggregation Options
- Aggregations: Important Considerations

### Module 06: Joins

- Lab 06: Exploring Various Types of Joins
- Introduction to Joins
- Regular Joins
- Optimized Joins
- Window Joins
- Other Types of Joins

### Module 07: Pattern Recognition

- Lab 07: Pattern Matching with MATCH\_RECOGNIZE
- Introduction to Pattern Recognition
- Defining Patterns
- Output and Match Navigation
- Navigating Along the Pattern Examples

### Module 08: UDFs

- Lab 08: Implementing a User-Defined Function (UDF)
- UDFs in Confluent Cloud
- Writing UDFs in Java

### Module 09: Advanced Statement Patterns

- Lab 09: Advanced Statement Patterns
- Unioning Multiple Topics
- EXECUTE STATEMENT SET for Fan-In/Fan-Out
- Exactly-Once Semantics for Kafka Sinks
- Statement Evolution with Carry-over Offsets
- Snapshot Queries
- State Management
- Monitoring and Managing Statements with DLQ

### Module 10: Connections

- Connections in Confluent Cloud
- External Tables
- AI/ML with Connections

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## Additional Information:

Official course book provided to participants

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## Further Information:

For More information, or to book your course, please call us on 00 966 92000 9278

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