

Snowflake Development – Data Engineering & Advanced Features (3 Months)

Duration: 3 Months (~120 Hours)

Mode: Live Online / Classroom

Tools & Technologies: Snowpipe, Streams, Tasks, Snowpark (Python/Scala/Java), External Functions, Spark Integration

Certifications Prepared: SnowPro Advanced: Data Engineer

Syllabus

Week 1: Data Ingestion with Snowpipe

- Event-driven vs manual ingestion; file notifications
- Integration with S3 / Azure Blob / GCS
- Configure Stage + Pipe; validate ingestion
- Hands-on: Auto-ingest JSON from S3 via SNS
- Assignment

Week 2: Data Modeling in Snowflake

- Star & Snowflake schema design; SCD types
- Design for semi-structured data; best practices
- Hands-on: Build schema for retail analytics
- Assignment

Week 3: Performance Optimization

- Clustering keys & Micro-partitioning strategies
- Search optimization service; pruning and statistics
- Result caching strategies and warehouse tuning
- Hands-on: Optimize queries on large tables
- Assignment

Week 4: Snowpark for Developers

- Snowpark APIs (Python, Java, Scala)
- DataFrame operations and UDFs in Snowpark
- Packaging & deployment to Snowflake
- Hands-on: Build ETL pipeline using Snowpark Python
- Assignment
- Mock Interview 1

Week 5: External Functions & API Integrations

- Creating external functions; Secrets & API integration
- Secure integration with AWS Lambda / Azure Functions
- Hands-on: External function to call REST API for FX rates

- Assignment

Week 6: Streams & Advanced Tasks

- Chained tasks, scheduling, and error handling
- Notifications & retries; orchestration patterns
- Hands-on: Automated CDC pipeline using chained tasks
- Assignment

Week 7: Integration with Big Data & ML

- Connecting Snowflake with Spark (JDBC/Connector)
- Data prep for ML; model serving options
- Hands-on: Train ML model using Snowflake + Python (sklearn)
- Assignment

Week 8: Capstone Project & Interview Prep

- Capstone: Real-time ETL pipeline with Snowpipe, Snowpark, and Tasks
- Assignment
- Mock Interview 2

Learning Outcomes

- Implement real-time ingestion with Snowpipe and event notifications
- Design advanced schemas and optimize performance at scale
- Develop transformations and ML-ready features with Snowpark
- Build secure external function integrations with cloud functions
- Automate complex workflows with chained Tasks & Streams
- Integrate Snowflake with Spark for big data and ML
- Prepare for SnowPro Advanced: Data Engineer Certification