**2025 Database and SQL (Day 1)**

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| Document Owner | Siddarth Sharma |
| Delivered by | Skillsoft |
| Duration | 1 day |

**Learning Objectives**

By the end of Day 1, learners will be able to:

* Understand the fundamentals of relational databases and the PostgreSQL architecture
* Execute core SQL commands (DDL & DML)
* Apply constraints and data types effectively
* Construct and optimize complex SQL queries
* Utilize PostgreSQL’s transaction control and indexing capabilities
* Leverage advanced PostgreSQL features
* Implement security, access control, and backup strategies

**Morning # Topics**

**DB and SQL** Module 1: Introduction to Relational Databases & PostgreSQL

o Overview of PostgreSQL architecture

o Client tools (psql, pgAdmin)

o DDL (CREATE, ALTER, DROP)

o DML (INSERT, UPDATE, DELETE, SELECT)

o Constraints (PRIMARY KEY, FOREIGN KEY, UNIQUE, NOT NULL)

o Data Types and Functions

o Common data types (INT, TEXT, BOOLEAN, DATE)

o Joins and Aggregations / INNER JOIN, LEFT JOIN, RIGHT JOIN, FULL JOIN

o GROUP BY, HAVING, Aggregate Functions

o Scalar, Correlated, and IN/EXISTS subqueries

o Creating and using views

o Basic Transactions and Indexes / BEGIN, COMMIT, ROLLBACK

o Introduction to indexing and performance impact

…contd.

**Afternoon # Topics**

**DB and SQL** Module 2: PostgreSQL Advanced Concepts

o Window Functions  
o Common Table Expressions (CTEs) and Recursive Queries  
o Working with JSON/JSONB  
o Indexing and Query Performance  
o Advanced index types (GIN, GiST, BRIN)  
o EXPLAIN and EXPLAIN ANALYZE  
o Security and Access Control  
o Role and permission management  
o Row-Level Security (RLS)  
o Basic backup and restore strategies (pg\_dump, PITR)

**LABS**

* <https://deutschebank.percipio.com/linked-contents/8d0363e4-4356-467c-8393-ecc37ea87baa/landing>
* https://deutschebank.percipio.com/linked-contents/e7b88bd2-5f97-49f5-8f46-e1b92e58fb46/landing