SQL for Data Science
Basic

Duration – 1.5 Days / 12 Hours

Program Description

This course covers fundamental SQL concepts essential for data science applications. It begins with an introduction to relational databases, database design, and entity-relationship (ER) modelling. Participants will learn to retrieve, filter, and sort data using SQL commands such as SELECT, WHERE, and ORDER BY. The course explores joins (INNER, LEFT, RIGHT, FULL OUTER), basic subqueries, and data aggregation. Learners will apply GROUP BY and HAVING to summarize datasets and perform fundamental analytics. By the end of this module, participants will have a strong foundation in SQL for querying structured data.

Learning Goals

- Understand relational database concepts and ER modelling
- Perform CRUD (Create, Read, Update, Delete) operations in SQL
- Write SQL queries to retrieve, filter, and sort data
- Use joins (INNER, LEFT, RIGHT, FULL OUTER) to combine tables
- Apply aggregate functions (SUM, AVG, COUNT, MIN, MAX)
- Use GROUP BY and HAVING for summarizing data

Course Topics

- Introduction to Databases & SQL, Database Design & ER Modelling
- Basic SQL Queries – SELECT, WHERE, ORDER BY
- Filtering & Sorting Data, Basic Joins & Subqueries
- Data Aggregation with GROUP BY & HAVING

SQL for Data Science
Advanced

Duration – 2 Days / 16 Hours

Program Description

This course delves into advanced SQL techniques essential for data analytics, and optimization. It begins with complex joins and subqueries, allowing participants to retrieve and manipulate data efficiently. Learners will explore window functions (ROW_NUMBER, RANK, DENSE_RANK) and Common Table Expressions (CTEs) to perform analytical computations. The course also covers data transformation and cleaning, utilizing functions. Further, the course introduces stored procedures and functions for automating repetitive tasks and managing transactions. Finally, learners will apply SQL for statistical and analytical operations, using advanced aggregations, time series analysis, and statistical functions

Learning Goals

- Perform advanced joins, complex subqueries, and recursive queries
- Use window functions (ROW_NUMBER, RANK, DENSE_RANK, PARTITION BY)
- Transform and clean data using SQL functions (CASE, COALESCE, CAST, STRING functions)
- Optimize query performance using indexing and execution plans
- Automate repetitive tasks with stored procedures and functions

Course Topics

- Advanced Joins & Complex Subqueries
- Window Functions & CTEs (Common Table Expressions)
- Data Cleaning & Transformation using SQL
- Performance Optimization – Indexing & Execution Plans
- Stored Procedures & Functions for Automation
- SQL for Data Science – Statistical & Analytical Functions

Note: All modules are enriched with real-world contextualization, using data and challenges from UPS's own operations to ensure immediate relevance and application.