



## SA - Power BI & SQL Projects Using AI

### 60 Hour Job-Oriented Course Outline

**Power BI Desktop & Service | SQL Server | MySQL | Power Query | DAX | AI-Assisted Analytics**

#### Course Promise

Participants will build practical, portfolio-ready analytics examples from raw data to SQL, Power Query, semantic model, DAX measures, dashboards, validation, and presentation.

### Course Overview

This course compresses a broad Power BI and SQL learning path into a project-driven 60-hour format by using generative AI as a productivity accelerator for SQL, Power Query, DAX, dashboard design, debugging, and documentation. Learners still validate every result manually through SQL checks, Power BI matrices, and business logic review.

#### Job-Oriented Value

This course is designed with a strong job-oriented focus for learners targeting roles such as Data Analyst, Power BI Developer, BI Analyst, MIS Executive, Reporting Analyst, SQL Analyst, and Business Analyst. By combining SQL, Power Query, data modeling, DAX, dashboard design, Power BI Service, and AI-assisted development, learners practice the same workflow used in real organizations: extracting data from databases and files, cleaning and modeling it, writing business calculations, building interactive reports, validating results, and presenting insights to stakeholders. The project-based structure helps learners build interview-ready confidence, portfolio-ready examples, and practical problem-solving ability instead of only learning isolated commands or formulas.

#### AI Advantage

AI is used to speed up query writing, measure drafting, explanation, debugging, and design thinking. Every generated result is checked against row counts, SQL totals, model relationships, and visual validation.

### Tools and Raw Data Formats

| Area     | Tools / Formats                                                                              |
|----------|----------------------------------------------------------------------------------------------|
| Database | SQL Server, SSMS, MySQL, MySQL Workbench                                                     |
| Raw data | CSV, Excel workbook, SQL scripts, text file, JSON/API-style examples                         |
| Power BI | Power BI Desktop, Power Query, DAX, DAX Query View concepts, Power BI Service                |
| AI       | Prompts for SQL, DAX, Power Query, visuals, debugging, validation, and interview explanation |



## Areas Covered Through Examples

- SQL environment setup, SSMS/MySQL Workbench usage, database creation, and query execution.
- SQL fundamentals: SELECT, aliases, calculated columns, filters, sorting, IN, BETWEEN, LIKE, null handling, and date filters.
- SQL data operations: INSERT, UPDATE, DELETE, transactions, rollback, commit, and data correction workflows.
- SQL table design: data types, primary keys, foreign keys, constraints, defaults, check rules, and indexes.
- SQL analysis: joins, multi-table joins, self joins, cross joins, grouping, HAVING, subqueries, CTEs, ranking, window functions, and pivots.
- SQL objects: views, stored procedures, parameters, user-defined function concepts, triggers, and temp tables.
- SQL Server and MySQL differences: syntax, date functions, procedures, identity/auto-increment, limits, and dialect notes.
- Raw data import: CSV, Excel, SQL tables, and text-file import.
- Power Query: cleaning, type changes, remove/rename columns, split/merge columns, append, merge, parameters, folder-style concepts, and web/API/JSON/PDF/XML-style handling.
- Data modeling: star schema, fact/dimension tables, relationships, cardinality, filter direction, hierarchies, hidden columns, and date table.
- Core DAX: calculated columns, explicit measures, SUM, SUMX, DIVIDE, CALCULATE, FILTER, ALL, ALLSELECTED, VALUES, SELECTEDVALUE, and SWITCH.
- Advanced DAX: context transition, iterator logic, ranking, dynamic Top N, Pareto, ABC segmentation, moving averages, cohort/retention, basket analysis, budget variance, inventory aging, and what-if analysis.
- Time intelligence: calendar table, month sorting, YTD, MTD, QTD, previous year, previous period, rolling windows, and non-consecutive date comparison.
- Power BI visuals: table, matrix, cards, bar, column, line, area, donut, map, filled map, gauge, scatter, treemap, decomposition tree, key influencers, Q&A, smart narrative, and small multiples.
- Report design: slicers, sync slicers, tooltips, drillthrough, bookmarks, buttons, page navigation, edit interactions, conditional formatting, color rules, and KPI thresholds.
- Power BI Service: publish, workspaces, reports vs dashboards, datasets/semantic models, sharing, subscriptions, export to PDF/PowerPoint, scheduled refresh, and incremental refresh concepts.
- Security and governance: RLS, roles, workspace permissions, dataset management, and refresh considerations.
- AI-assisted analytics: prompts for SQL, DAX, Power Query, dashboard layout, debugging, optimization, documentation, and validation.
- Career readiness: portfolio demos, capstone dashboard, interview explanation points, business storytelling, and stakeholder presentation.



## Suggested Numbered Demo Mapping

| No. | Demo                                                             | What Participants Practice                                                         |
|-----|------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 001 | SQL Environment Setup and AI Query Prompting                     | Install tools, create first database, understand AI prompt workflow.               |
| 002 | Sales Database Creation in SQL Server and MySQL                  | Build a normalized sales database with keys, constraints, inserts, and indexes.    |
| 003 | SELECT WHERE ORDER BY Aliases and Calculated Columns             | Practice basic SQL retrieval, filtering, sorting, aliases, and calculated columns. |
| 004 | Date Filters Between Year Month Quarter Analysis                 | Analyze sales by date ranges, months, quarters, and calendar attributes.           |
| 005 | Joins for Customer Product Sales Model                           | Use joins across customer, product, region, order, and order detail tables.        |
| 006 | Group By Aggregations and KPI Dataset                            | Create grouped KPI outputs for revenue, profit, quantity, and margin.              |
| 007 | Subqueries CTEs and Window Ranking                               | Use subqueries, CTEs, ROW_NUMBER, RANK, and dense ranking for business analysis.   |
| 008 | SQL Views for Power BI Reporting                                 | Create reusable reporting views that Power BI can consume cleanly.                 |
| 009 | Stored Procedures Parameters and Reusable Reporting Logic        | Create parameterized stored procedures for reporting filters.                      |
| 010 | Temp Tables Transactions and Data Correction Workflow            | Use temp tables and transactions to stage and correct business data safely.        |
| 011 | SQL Pivot Crosstab and Denormalized Reporting Table              | Create pivot/crosstab outputs and denormalized report tables.                      |
| 012 | Import SQL Data into Power BI and Build Relationships            | Connect Power BI to SQL data and build a star-schema model.                        |
| 013 | Power Query Cleaning Headers Types Appending Files               | Clean messy CSV/Excel files, fix headers/types, and append files.                  |
| 014 | Calendar Table and Time Intelligence Foundation                  | Create calendar tables and prepare date logic for DAX time intelligence.           |
| 015 | Core DAX Measures Sales Profit Margin Contribution               | Write explicit measures for sales, cost, profit, margin, and contribution.         |
| 016 | SUM vs SUMX FILTER ALL and Context Transition                    | Understand row context, filter context, iterators, and CALCULATE behavior.         |
| 017 | Customer Profitability Dashboard with Slicers and Tooltips       | Build an interactive customer profitability dashboard with tooltip pages.          |
| 018 | HR Analytics Dashboard Bins Ratings Conditional Formatting       | Analyze employees, tenure, satisfaction, performance, salary, and attrition risk.  |
| 019 | Moving Average Previous Period and Non Consecutive Date Analysis | Build rolling averages and previous transaction-date comparisons.                  |
| 020 | Dynamic Measure Selector with SWITCH and SELECTEDVALUE           | Create disconnected metric selector tables and dynamic visuals.                    |
| 021 | Advanced DAX Scenario Profit Contribution and Pareto Analysis    | Create Pareto and cumulative contribution analysis by customer/product.            |
| 022 | Advanced DAX Scenario ABC Customer Segmentation                  | Segment customers into A/B/C groups using cumulative sales contribution.           |



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|-----|---------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 023 | Advanced DAX Scenario Cohort Retention and Repeat Customers         | Analyze first purchase, repeat customers, and cohort retention patterns.             |
| 024 | Advanced DAX Scenario Same Store Sales and Like for Like Comparison | Compare sales only for stores active in both comparison periods.                     |
| 025 | Advanced DAX Scenario Basket Analysis and Cross Sell                | Identify product combinations and cross-sell opportunities.                          |
| 026 | Advanced DAX Scenario Budget vs Actual with Variance Drivers        | Compare budget vs actual and explain variance drivers.                               |
| 027 | Advanced DAX Scenario Inventory Aging and Stockout Risk             | Analyze stock age, reorder risk, and inventory health.                               |
| 028 | Advanced DAX Scenario Dynamic Top N Ranking with Others             | Create dynamic Top N visuals with an Others bucket.                                  |
| 029 | Advanced DAX Scenario What If Parameters and Scenario Planning      | Simulate discounts, targets, margins, and growth assumptions.                        |
| 030 | Advanced DAX Scenario Calculation Groups Conceptual Pattern         | Teach calculation-group style reusable time/metric patterns conceptually.            |
| 031 | Map Web JSON CSV PDF Excel Text and API Data Sources                | Import from CSV, Excel, SQL, text, JSON-style, PDF-style, and API-style sources.     |
| 032 | DAX Query View Measure Testing and Optimization                     | Use DAX Query View style queries to test, debug, and validate measures.              |
| 033 | Power BI Service Workspace Sharing Refresh and RLS                  | Publish reports, configure workspaces, refresh, subscriptions, and RLS logic.        |
| 034 | AI Assisted Capstone SQL to Power BI Executive Dashboard            | Build an end-to-end executive dashboard using SQL, Power Query, DAX, and AI prompts. |