Course Title: Data Analytics with Power BI And SQL

Course Description: This course is designed to provide you with a solid foundation of data analytics skills using Power BI and SQL. You will learn how to work with large data sets, transform and clean data, perform data analysis using statistical techniques, and present insights using visualizations.

Power BI Course Outline;

1. Introduction to Power BI
    - ☒ Overview of Power BI and its components
    - ☐ Understanding the Power BI ecosystem
    - ☐ Setting up Power BI Desktop
2. Connecting to Data Sources
    - ☐ Importing data from Excel, CSV, SQL Server, and other sources
    - ☐ DirectQuery vs. Import data connection
    - ☐ Connecting to cloud-based data sources (Azure, SharePoint, etc.)
3. Data Transformation and Data Modeling
    - ☐ Data cleaning and shaping using Power Query Editor
    - ☐ Data modeling concepts (tables, relationships, keys)
    - ☐ Creating calculated columns and measures using DAX (Data Analysis Expressions)
    - ☐ Hierarchies and custom hierarchies

4. Data Visualization

    - ☐ Introduction to data visualization principles
    - ☐ Creating interactive visuals (bar charts, line charts, pie charts, etc.)
    - ☐ Customizing visuals (colors, formatting, labels)
    - ☐ Using slicers and filters for interactive analysis

5. Advanced Data Analytics Techniques

    - ☐ Advanced DAX functions (CALCULATE, FILTER, RELATED, etc.)
    - ☐ Time intelligence functions (DATESYTD, DATEADD, etc.)
    - ☐ Statistical functions for analytics (RANKX, PERCENTILEX, etc.)
    - ☐ Analyzing data with Quick Measures

6. Creating Dashboards and Reports

    - ☐ Designing interactive dashboards
    - ☐ Adding tiles, text boxes, and images to dashboards
    - ☐ Creating drill-down reports for detailed analysis
    - ☐ Using bookmarks and buttons for navigation

7. Data Sharing and Collaboration

    - ☐ Publishing reports to Power BI Service
    - ☐ Sharing reports and dashboards

- ☐ Collaborating with colleagues using Power BI apps

8. Case Studies and Real-World Applications
    - ☐ Analyzing real-world datasets using Power BI
    - ☐ Solving business problems with data analytics
    - ☐ Presenting findings and insights
9. Project Work
    - ☐ Hands-on project to apply learned concepts
    - ☐ Analyzing a given dataset and creating interactive reports
    - ☐ Peer review and feedback

SQL Course Outline;

A. <u>Introduction to Databases and SQL</u>

1. **Introduction to Data Analytics**
    - Overview of Data Analytics
    - Importance of SQL in Data Analytics
2. **Database Fundamentals**
    - What is a Database?
    - Relational vs. Non-Relational Databases
    - Introduction to RDBMS (Relational Database Management Systems)

3. **SQL Basics**
    - Introduction to SQL
    - SQL Syntax and Conventions
    - Basic SQL Commands: SELECT, FROM, WHERE

B. SQL Querying Fundamentals

1. **Basic Querying**
    - Using SELECT Statements
    - Filtering Data with WHERE Clauses
    - Sorting Data with ORDER BY
2. **Advanced Filtering**
    - Using Comparison Operators
    - Combining Conditions with AND, OR, and NOT

C. Working with Multiple Tables

1. **Joins**
    - Understanding Primary and Foreign Keys
    - INNER JOIN
    - LEFT JOIN, RIGHT JOIN, FULL OUTER JOIN
2. **Complex Joins**

- Self Joins
- Cross Joins
- Using Joins with Aggregations

D. Data Aggregation and Grouping

1. **Aggregate Functions**
    - COUNT, SUM, AVG, MIN, MAX
2. **Grouping Data**
    - GROUP BY Clause
    - HAVING Clause
    - Combining Aggregations with Joins

E. Subqueries and Nested Queries

1. **Introduction to Subqueries**
    - Using Subqueries in SELECT, FROM, and WHERE Clauses
2. **Correlated Subqueries**
    - Understanding and Writing Correlated Subqueries

F. Data Manipulation

1. **Inserting Data**

- INSERT INTO Statement

2. **Updating Data**
    - UPDATE Statement
3. **Deleting Data**
    - DELETE Statement
    - TRUNCATE Statement

G. Advanced SQL Functions

1. **String Functions**
    - CONCAT, LENGTH, SUBSTRING, REPLACE
2. **Date and Time Functions**
    - NOW, DATE_ADD, DATE_SUB, DATE_FORMAT
3. **Numeric Functions**
    - ROUND, CEIL, FLOOR, ABS

H. Indexes and Performance Optimization

1. **Indexes**
    - Creating Indexes
    - Using Indexes for Performance Improvement
2. **Query Optimization**

- Analyzing Query Performance with EXPLAIN
- Best Practices for Writing Efficient Queries

I. Data Visualization with SQL

1. Basic Visualization Concepts

- Importance of Data Visualization
- Types of Data Visualizations

2. Generating Reports

- Using SQL to Prepare Data for Visualization
- Tools for Visualizing SQL Data (e.g., Tableau, Power BI)

J. Real-World Applications and Case Studies

1. Case Study: Sales Data Analysis

- Analyzing Sales Data with SQL
- Generating Insights and Reports

2. Case Study: Customer Segmentation

- Using SQL for Customer Segmentation
- Practical Applications in Marketing

K. Capstone Project and Review

1. Capstone Project

- Students Work on a Comprehensive Project
- Applying All Learned Concepts