Advanced Querying and Database Optimization for SQL Developer

Day 1: Foundations of Advanced Querying

- **Module 01: Introduction**
    - Benefits of Advanced Querying in SQL Databases
    - Overview of T-SQL
    - Tools Required for Advanced Querying (SSMS, Azure Data Studio, Azure Portal)
- **Module 02: Basic Querying with T-SQL**
    - Introduction to Basic Querying
    - Retrieving Data from Tables
    - Sorting Data
    - Filtering Data

Day 2: Combining and Summarizing Data

- **Module 03: Joins and Subqueries**
    - Combining Data from Multiple Tables
    - Inner Joins, Outer Joins, Self Joins
    - Writing and Using Subqueries
- **Module 04: Aggregating Data**
    - Grouping Data
    - Aggregate Functions (SUM, AVG, COUNT, etc.)
    - Handling NULL Values in Aggregations

Day 3: Advanced Data Structuring

- **Module 05: Table Expressions**
    - Common Table Expressions (CTEs)
    - Recursive CTEs
    - Derived Tables
    - Temporary Tables
- **Module 06: Advanced Querying Techniques (Part 1)**
    - Using Window Functions

- Ranking Functions
- Pivoting and Unpivoting Data

Day 4: Procedural Programming & Performance Concepts

- **Module 06: Advanced Querying Techniques (Part 2)**
  - Creating Temporary Tables and Table Variables
- **Module 07: Stored Procedures, Functions, and Triggers**
  - Creating and Using Stored Procedures
  - User-defined Functions
  - Triggers for Automation and Auditing
- **Performance Essentials in SQL Databases**
  - Understanding Execution Plans (Advance → Detailed Analysis)
  - Indexing in Detail (Clustered, Non-Clustered, Covering, Include Index)
  - Parameter Sniffing: Identification and Mitigation
  - Locking and Deadlock
  - Isolation Level for SQL

Day 5: Monitoring, Optimization & Azure SQL DB

- **Module 08: Error Handling & Transactions**
  - Error Handling with TRY-CATCH Blocks
  - Transactions: BEGIN, COMMIT, ROLLBACK
- **Module 09: Performance Monitoring & Query Optimization**
  - Monitoring through Azure Portal
  - DMVs in Azure SQL Database
  - Query Store: Tracking & Forcing Plans
  - Profiling with SSMS for Azure SQL DB (How to Read Graphs)
  - Performance Testing Using Index, Execution Plan, Optimization Query
  - Working on compression, Decompression and Page fill factor
  - SQL Injection
  - Query Optimization Techniques (Best Practices for Azure + On-Prem)