**COURSE OUTLINE**

**🔵 DAY 1: Foundations of Data Warehousing & PL/SQL**

**1. Introduction to PL/SQL for Data Warehousing**

* Purpose of PL/SQL in data transformation and storage
* Differences between SQL and PL/SQL
* Procedural features: variables, control flow, blocks
* Real-world use cases in warehousing (ETL scripting, data integrity checks)

**2. Overview of Data Warehousing Concepts**

* Data warehouse vs OLTP systems
* Data mart, fact tables, dimension tables
* Star and snowflake schemas
* Data staging, data quality, historical data storage

**3. SQL Server as a Data Warehousing Platform**

* Features: scalability, partitioning, indexing, compression
* Data file management and security
* **Backup and Restore:**
  + Full, differential, and log backups
  + Restore strategies (overwrite, point-in-time)
  + Automated backups with SQL Server Agent
  + Backup compression and storage strategies

**🟢 DAY 2: Core PL/SQL Programming**

**4. PL/SQL Syntax and Programming Structure**

* Anonymous vs named blocks
* Declaration, execution, and exception sections
* Comments and formatting best practices

**5. Control Flow Statements and Looping Structures**

* IF, CASE, WHILE, LOOP, EXIT, CONTINUE
* Nesting and indentation for clarity
* Use cases in conditional data validation and transformation

**6. Exception Handling in PL/SQL**

* Types of exceptions: predefined, user-defined
* WHEN OTHERS, RAISE\_APPLICATION\_ERROR
* Logging and recovery strategies

**🔴 DAY 3: Advanced PL/SQL**

**7. Using Cursors**

* Implicit vs explicit cursors
* Cursor attributes (%FOUND, %NOTFOUND)
* Cursor loops for row-by-row operations

**8. Stored Procedures**

* Syntax and structure
* Parameters (IN, OUT, IN OUT)
* Reusability and modular programming

**9. Triggers**

* BEFORE, AFTER, INSTEAD OF triggers
* Row-level vs statement-level
* Auditing and automation scenarios

**10. Dynamic SQL**

* EXECUTE IMMEDIATE
* Binding variables
* Building flexible queries for variable tables or columns

**🟡 DAY 4: ETL with SSIS**

**11. Introduction to SSIS**

* Role in the ETL pipeline
* SSIS architecture and tools (Control Flow, Data Flow, Connection Managers)
* Data flow transformations (Merge, Union All, Conditional Split)

**12. Developing ETL Packages**

* Building packages using Visual Studio
* Reading from multiple sources (CSV, Excel, DB)
* Data cleansing and staging

**13. Monitoring and Debugging**

* Breakpoints and data viewers
* Error redirection and logging
* Performance tuning (buffer sizes, parallelism)

**14. Integrating PL/SQL with SSIS**

* Calling PL/SQL scripts or procedures
* Using Execute SQL Task to interact with SQL Server
* Managing transactions and rollbacks

**🟣 DAY 5: Power BI for Data Warehousing**

**15. Introduction to Power BI Dashboards**

* Overview of Power BI interface
* Connecting to SQL Server Data Warehouse
* Creating reports and visualizations

**16. Modeling and Row-Level Security**

* Building relationships and hierarchies
* Creating calculated columns and measures
* Enabling user-level security using roles

**17. DAX and Power Query**

* DAX formulas: CALCULATE, FILTER, SUMX, etc.
* Power Query editor: M language basics
* Data transformation and custom columns

**18. Advanced Visualizations**

* Bookmarks, tooltips, and drill-throughs
* KPI indicators, slicers, and maps
* Storytelling with Power BI dashboards

**⚫ DAY 6: Project Development & Presentation**

**19. Group Work: Designing a Data Warehouse Solution**

* Formulating requirements (business context)
* Schema design and dimension-fact modeling

**20. End-to-End Project**

* ETL using SSIS
* Transformation logic in PL/SQL
* Final dashboard in Power BI

**21. Presentation & Evaluation**

* Project demonstration
* Peer and trainer feedback
* Wrap-up and certification