DataNOW Masterclass: End-to-End SQL for Data Analytics and Data Warehousing

Course Title: DataNOW Masterclass: End-to-End SQL for Data Analytics and Data Warehousing
Duration: 7 sessions (4 hours per each)
Target Audience: Aspiring data analysts, database administrators, data engineers, and business intelligence professionals seeking a comprehensive understanding of SQL, data warehousing, and ETL processes

Mission Alignment: Aligned with DataNOW's mission to offer accessible, adaptable, and impactful training, this course empowers learners to master SQL across its lifecycle, including data warehousing, ETL, and business intelligence integration.
Vision Alignment: Participants will acquire practical SQL skills that enable them to manage databases, transform data, and create reports, aligning with the vision of a data-literate professional community that drives data-based decision-making.
Core Values Integration:

- Dedication: Each session is meticulously crafted to ensure participants gain maximum value and practical skills.
- Accessibility: The masterclass is designed to be affordable and accessible to a diverse audience.
- Transparency: Clear and honest communication is maintained throughout the course.
- Adaptability: The syllabus is flexible to accommodate the latest trends and technologies.
- Nurturing: A supportive learning environment is fostered, encouraging collaboration and growth.
- Optimization: The curriculum is continually refined for optimal learning outcomes.
- Workmanship: Insights and best practices are shared, leveraging collective knowledge for better learning experiences.

Week 0: Course Introduction

Duration: 45 minutes

- Welcome and Introduction
- Overview of the Course Structure and Objectives
- Review of prerequisites and technical setup for SQL and SSIS

Week 1: SQL Fundamentals and Database Concepts

Session 1: Introduction to Relational Databases and SQL Basics

- Overview of relational database concepts
- Introduction to SQL syntax, SELECT statements, and data types
- Simple data queries for data retrieval and manipulation

Session 2: Data Filtering, Sorting, and Basic Functions

- Using WHERE, ORDER BY, and LIMIT

- Introduction to basic functions like COUNT, SUM, AVG, MIN, and MAX

Session 3: Relational Data Models and Key Concepts

- Understanding primary keys, foreign keys, and relationships
- Overview of data normalization (1NF, 2NF, 3NF) and its benefits

Session 4: Hands-On Activity

- Writing basic SQL queries and creating simple relational data models

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Week 2: Intermediate SQL and Data Manipulation

Session 1: Advanced Querying Techniques

- GROUP BY and HAVING clauses for aggregated data analysis
- Introduction to subqueries and derived tables for complex queries

Session 2: Joins and Relationships in SQL

- Types of joins: INNER, LEFT, RIGHT, FULL, and SELF JOINS
- Practical applications of joins in multi-table querying

Session 3: Data Manipulation and Transactions

- Understanding INSERT, UPDATE, DELETE commands
- Introduction to transactions with COMMIT and ROLLBACK for data integrity

Session 4: Hands-On Activity

- Exercises on joins, subqueries, and data manipulation with transactions

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Week 3: Database Design, Indexing, and Query Optimization

Session 1: Database Design and Data Modeling

- Data modeling techniques and ERD creation
- Setting up tables, indexes, and relationships for efficient querying

Session 2: Indexing and Query Optimization Techniques

- Understanding indexing and its impact on performance
- Introduction to execution plans and query optimization tips

Session 3: Stored Procedures, Views, and Triggers

- Creating and using stored procedures and views
- Implementing triggers for automated data processes

Session 4: Hands-On Activity

- Practical exercises on indexing, stored procedures, views, and query optimization

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Week 4: Introduction to Data Warehousing and Advanced SQL

Session 1: Fundamentals of Data Warehousing

- Overview of data warehousing concepts (OLTP vs OLAP)
- Star and snowflake schemas, dimension and fact tables

Session 2: Advanced SQL Concepts for Data Warehousing

- Using complex queries and advanced functions (e.g., CASE, window functions)
- Best practices for querying large datasets in data warehouses

Session 3: Designing a Data Warehouse Model

- Structuring dimension and fact tables for efficient reporting
- Hands-on creation of a simple data warehouse model

Session 4: Hands-On Activity

- Designing a basic data warehouse schema and querying data for insights

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Week 5: ETL Processes and SSIS Integration

Session 1: Overview of ETL (Extract, Transform, Load) Process

- Introduction to ETL concepts, challenges, and common workflows
- Data extraction, data transformation, and loading strategies

Session 2: Introduction to SQL Server Integration Services (SSIS)

- Setting up SSIS, creating packages, and understanding SSIS components
- Data flow tasks, transformations, and control flow basics

Session 3: Building ETL Workflows with SSIS

- Practical steps to design ETL workflows for data migration
- Implementing error handling and logging in SSIS packages

Session 4: Hands-On Activity

- Creating and deploying a basic ETL process using SSIS

Week 6: Advanced Data Warehousing and Business Intelligence Reporting

Session 1: Advanced Data Warehousing Techniques

- Managing slowly changing dimensions (SCDs) and surrogate keys
- Data partitioning, archiving, and performance optimization

Session 2: Reporting and Visualization Tools (Power BI/SSRS)

- Introduction to Power BI and SSRS for SQL data visualization
- Connecting SQL databases to Power BI for live reporting

Session 3: Real-World Reporting Scenarios

- Designing dashboards and reports for end-user insights
- Optimizing data models for quick access and efficient analysis

Session 4: Hands-On Activity

- Building a data report in Power BI connected to a SQL data warehouse

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Week 7: Final Project, Data Security, and Course Wrap-Up

Session 1: Implementing Security in SQL and SSIS

- Role-based access control, row-level security, and encryption basics
- SSIS package security and data protection best practices

Session 2: Final Project Work

- Participants apply SQL, ETL, and reporting skills in a comprehensive project
- Integrating SQL data models, SSIS packages, and Power BI dashboards

Session 3: Project Presentation and Feedback

- Participants present their projects with insights and explanations
- Instructor and peer feedback, plus Q&A session

Session 4: Course Conclusion and Resources

- Recap of key concepts, best practices, and real-world applications
- Guidance on further learning and industry resources

**********NOTHING FOLLOWS**********