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Learning Style: Virtual Classroom

Technology:

Difficulty: Beginner

Course Duration: 3 Days

Next Course Date: March 23, 2026

Introduction to SQL Programming Basics (TTSQL002)

About This Course:

SQL, or Structured Query Language, serves as the backbone of modern data management and manipulation. Understanding its principles allows technical

professionals to create, maintain, and interrogate databases, giving them the power to make data-driven decisions that can shape the success of their organizations. From e-commerce platforms to complex inventory systems, SQL is the key to managing big data and transforming it into actionable insights.

Geared for experienced technical professionals, Introduction to SQL Programming is a three-day, hands-on course that will provide you with a solid understanding of SQL programming, providing you with the tools, techniques, and insights required to excel in database management and analysis.

Throughout the course, you'll learn how to handle data challenges with creativity and precision, learning how to extract, analyze, and interpret large datasets. This includes developing abilities to craft, interpret, and optimize SQL queries, analyze data, and implement effective database solutions, leading to informed, data-driven decision-making. You'll explore relational design principles, entity relationship diagrams, and the creation of efficient data models to represent complex relationships within data. The course also covers how to construct, interpret, and optimize SQL queries, including the use of functions, joins, subqueries, and advanced analytical techniques.

Through extensive lab work, you'll gain the foundational knowledge and practical skills required to tackle various data challenges with confidence and creativity. You'll exit the course equipped with the SQL knowledge and skills needed to craft, interpret, and optimize SQL queries, analyze data, and implement effective database solutions, leading to informed, data-driven decision-making within your organization.

Course Objectives:

- Basic RDBMS Principles: Learn the art of relational design, entity relationship diagrams, data domains, and more.
- The SQL Language and Tools: Get acquainted with SQL*Plus, EZConnect, and other vital SQL and PL/SQL commands.
- Using SQL Developer: Configure connections, understand different tabs, and become proficient in Query Builder.
- Essential Query Mechanics: Grasp SQL query basics, functions, ANSI 92 Joins, ANSI 99 Joins, and delve into subqueries.
- Advanced Analytics: Explore regular expressions, analytics, ranking functions, pattern matching, and more. Throughout the course, hands-on labs will enable participants to apply the learned concepts directly, simulating real-world projects. Whether designing intricate data structures or performing nuanced data analyses, these exercises provide a practical understanding of how SQL can be applied on the job.
- Data Analysis Essentials: Discover how to extract, analyze, and interpret data, deriving insights that can guide organizational strategies.

- Database Management: Learn to construct and manage sophisticated database systems, ensuring efficiency and reliability.

- Versatile Tool Utilization: Master tools like SQL Developer and SQL*Plus, harnessing their full capabilities to optimize your database operations.

Audience:

- Basic Computer Literacy: Familiarity with operating systems, file management, and general computer navigation to ensure a smooth transition into learning SQL tools and environments.

- Understanding of Fundamental Data Concepts: A grasp of basic data concepts like tables, records, and fields would aid in understanding relational databases and how

- SQL operates within them.

- Basic technical background: Although specific prior scripting experience isn’t required to attend, we recommend that you have a background in IT or other technical topics or skills

Prerequisites:

- Basic Computer Literacy: Familiarity with operating systems, file management, and general computer navigation to ensure a smooth transition into learning SQL tools and environments.

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Course Outline:

Basic RDBMS Principles

- Relational design principles
- Accessing data through a structured query language
- Entity relationship diagrams
- Data Domains
- Null values
- Indexes
- Views
- Denormalization
- Data Model Review

The SQL Language and Tools

- Using SQL*Plus
- Why Use SQL*Plus When Other Tools Are Available?
- Starting SQL*Plus
- EZConnect
- SQL Commands
- PL/SQL Commands
- SQL*Plus Commands
- The COLUMN Command
- The HEADING Clause
- The FORMAT Clause
- The NOPRINT Clause
- The NULL Clause
- The CLEAR Clause
- Predefined define variables
- LOGIN.SQL

- Command history
- Copy and paste in SQL*Plus
- Entering SQL commands
- Entering PL/SQL commands
- Entering SQL*Plus commands
- Default output from SQL*Plus
- Entering Queries
- What about PL/SQL?

Using SQL Developer

- Choosing a SQL Developer version
- Configuring connections
- Creating A Basic Connection
- Creating A TNS Connection
- Connecting
- Configuring preferences
- Using SQL Developer
- The Columns Tab
- The Data Tab
- The Constraints Tab
- The Grants Tab
- The Statistics Tab
- Other Tabs
- Queries In SQL Developer
- Query Builder
- Accessing Objects Owned By Other Users

- The Actions Pulldown Menu
- Differences between SQL Developer and SQL*Plus
- Reporting Commands Missing In SQL Developer
- General Commands Missing In SQL Developer
- Data Dictionary report
- User Defined reports
- Using scripts in SQL Developer

SQL Query Basics

- Understanding the data dictionary
- Exporting Key Data Dictionary Information
- The Dictionary View
- Components of a SELECT Statement
- The SELECT Clause
- The FROM Clause
- The WHERE Clause
- The GROUP BY Clause
- The HAVING Clause
- The ORDER BY Clause
- The START WITH And CONNECT BY Clauses
- The FOR UPDATE Clause
- Set Operators
- Column Aliases
- Fully Qualifying Tables and Columns
- Table Aliases
- Using DISTINCT and ALL in SELECT statements

WHERE and ORDER BY

- WHERE clause basics
- Comparison operators
- Literals and Constants in SQL
- Simple pattern matching
- Logical operations
- The DUAL table
- Arithmetic operations
- Expressions in SQL
- Character operators
- Pseudo columns
- Order by clause basics
- Ordering Nulls
- Accent and case sensitive sorts
- Sampling data
- WHERE and ORDER BY in SQL Developer
- All, Any, Some

Functions

- The basics of functions
- Number functions
- Character functions
- Date functions
- Conversion functions
- Other functions

- Large object functions
- Error functions
- The RR format mode;
- Leveraging your knowledge

ANSI 92 JOINS

- Basics of ANSI 92 Joins
- Using Query Builder with multiple tables
- Table Aliases
- Outer joins
- Outer Joins In Query Builder
- Set operators
- Self-referential joins
- Non-Equijoins

ANSI 99 Joins

- Changes with ANSI99
- CROSS Join
- NATURAL Join
- JOIN USING
- JOIN ON
- LEFT / RIGHT OUTER JOIN
- FULL OUTER JOIN

GROUP BY and HAVING

- Introduction to GROUP functions Limiting Rows
- Including NULL

- Using DISTINCT With Group Functions
- GROUP function requirements
- The HAVING clause
- Other GROUP function rules
- Using Query Builder with GROUP clauses
- ROLLUP and CUBE
- The Grouping function
- Grouping Sets

Subqueries

- Why use subqueries?
- WHERE clause subqueries
- FROM clause subqueries
- HAVING clause subqueries
- CORRELATED subqueries
- SCALAR subqueries
- DML and subqueries
- EXISTS subqueries
- Hierarchical queries
- TOP N AND BOTTOM N queries
- Creating subqueries using Query Builder

Regular Expressions

- Available Regular Expressions
- Regular Expression Operators
- Character Classes

- Pattern matching options
- REGEX_LIKE
- REGEXP_SUBSTR
- REGEXP_INSTR
- REGEXP_REPLACE
- REGEXP_COUNT

Analytics

- The WITH clause
- Reporting aggregate functions
- Analytical functions
- User-Defined bucket histograms
- The MODEL clause
- PIVOT and UNPIVOT
- Temporal validity

More Analytics

- RANKING functions
- RANK
- DENSE_RANK
- CUME_DIST
- PERCENT_RANK
- ROW_NUMBER
- Windowing aggregate functions
- RATIO_TO_REPORT
- LAG / LEAD

- Linear Regression functions
- Inverse Percentile functions
- Hypothetical ranking functions
- Pattern Matching