



Gwani Software



TRAINING DEPARTMENT
(Knowledge & Expertise)

SQL Fundamentals Curriculum

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SQL Fundamentals

General Description: - This course is intended to provide basic and advanced skills needed in using SQL on wide range of database management systems.

Aims: - The aims of this course are to:

1. Introduce the trainee into uses of SQL in database.
2. Drill the trainee on syntax and building blocks of SQL.
3. Drill the trainee on programming capabilities of SQL.
4. Drill the trainee on syntax and usage of SQL plus.
5. Drill the trainee on syntax and usage of PL/SQL.
6. Avail the trainee with basic database design skills.

Objectives: - The trainee at the end of the training session should be able to;

- Understand how to use SQL in database design & management.
- Understand the syntax and building blocks of SQL.
- Write SQL commands to achieve database management abilities.
- Write SQL plus commands to manage database.
- Understand and use basic skills in designing database.

Target Audience: - This course should be taken by computer scientists, information Technologists, database administrators, database designers, programmers and any database staff.

Approximate Duration: - This course requires 21 hours of extensive class sessions with practical.

Method of Assessment: - The trainee is to be assessed with an examination on lessons covered.

Methodology:- The class takes a lesson discusses it, then conducts practical on it and proceeds to the next lesson until all the lessons are discussed and practical conducted.

Recommended Resource Materials: - The following materials are resourceful and are hereby recommended;

1. Teach Yourself SQL in 21 days, Second Edition.
2. Tony Bam, Mike Benkovich, Robin Dewson, Sam Ferguson, Christopher Graves, Terrence J. Joubert, Denny Lee, Mark Scott, Robert Skoglud, Pay Turley, Sakhir Youness, 'Professional SQL server 2000 data warehousing with analysis services'. Wrox press Ltd.

Day	Lesson
1.	Introduction: History & origin of SQL, RDBMS non procedural language, differences from DBMS & RDBMS; Standard-ANSI-92. History of databases, Dr. Codd's 12 rules for a relational database model. Employee record study. Database structure, normalization database landscape, cross-product language, SQL & event-server application, development, open database connectivity (ODBC), SQL in application programming.
2.	Query: - SELECT statement, General syntax, SELECT & FROM, terminating an SQL statement, selecting different tables, queries with distinction.
3.	Expressions: - expressions, conditions, and operators, WHERE clause, Arithmetic operators, comparison operators, character operators (LIKE), concatenation (), union & union call, intersect, minus (difference), miscellaneous operators (IN and BETWEEN).
4.	Molding data retraced: Aggregate functions, count, sum, AVG, MAX, MIN, VARIANCE, STDEV, Date & Time functions, ADD-MONTHS, LAST-DAY, MONTHS-BETWEEN, NEW-TIME, NEXT-DAY SYSDATE. Arithmetic functions; - ABS, CEIL & FLOOR, COS, COSH, SIN, SINH, TAN, and TANH, EXP, LN and LOG, MOD, POWER, SIGN, SQRT. Character functions: - CHR, CONCAT, INITCAP, LOWER, and UPPER, LPAD and RPAD, LTRIM and RTRIM, REPLACE, SUBSTR, TRANSLATE.
5.	Clauses in SQL: - WHERE clause, STARTING WITH clause, ORDER BY clause, GROUP BY clause, combining clauses.
6.	Joining Tables: - Multiple tables in a single SELECT statement, Equi-joins, Non-Equi-joins, Outer joins versus Inner joins, joining a table to itself.
7.	Sub queries:- Embedded SELECT statement, building a sub query,

	aggregate functions with sub queries, Nested sub queries, correlated sub queries, using EXISTS, ANY and ALL.
8.	Manipulating Data: - INSERT statement, INSERT---SELECT statement, UPDATE statement, DELETE statement, Importing & exporting Data from foreign sources.
9.	Creating & manipulating tables:- CREATE DATABASE statement, CREATE DATABASE options, Database design, data dictionary, creating key fields, CREATE TABLE statement, DROP TABLE statement, DROP DATABASE statement.
10.	Creating views & indexes: - using view, a simple view renaming columns, SQL view processing, modifying data in view, views & security, DROP VIEW statement.
11.	Controlling transactions: - Transaction control, banking application, beginning a transaction, finishing a transaction, canceling transaction, using transaction save points.
12.	Database Security: - Popular database products & security, creating users, user privileges, user access to views, WITH GRANT OPTION clause.
13.	Advanced SQL:- Temporary tables, cursors, creating a cursor, scrolling a cursor, testing a cursor's status, closing a cursor, scope of cursors, creating and using stored procedures, removing stored procedures, Nesting stored procedures, designing & using triggers, triggers & transactions, using SELECT commands with UPDATE & DELETE. Embedded SQL, static & dynamic SQL, programming with SQL.
14.	Dynamism of SQL:- ODBC, Oracle, inter base SQL (ISQL) Visual CTT, Delphi, using visual CTT & SQL, using Delphi & SQL.
15.	Performance: - Readability, procedures, OLAP vs. OLTP, obstacles.
16.	Views & Data dictionary: - Data dictionary, users of data dictionary, contents of the data dictionary, Database growth, space allocated, space available, Rollback segments.
17.	Virtual SQL statements:- Set echo on/off, set feedback on/off, set heading on/off, spool filename on/off, start filename, edit filename, counting the rows in all tables, granting system privileges to multiple users, granting privilege table to another user, Disabling table constraints to load data, Generating shell scripts,.
18.	PL/SQL: - Introduction, Data types in PL/SQL, Character sting data types, Numeric Data types, structure of a PL/SQL Block, DECLARE section, constant Assignment, % type attribute, % row count, PROCEDURE section. BEGIN---END, Cursor control commands,

	DECLARE, OPEN, FETCH, CLOSE, conditional statements, IF---THEN LOOPS, EXCEPTION section, Raising Exceptions, Handling exceptions, executing a PL/SQL Block, displaying output to the user, transactional control in PL/SQL.
19.	Transact-SQL:- Basic components, Data types, character strings, Numeric data types, Date data types, money data types, Binary strings, Accessing database with transact-SQL, Declaring local variables, declaring global variables, using variables, PRINT command, flow control, BEGIN & END statements, IF---ELSE statements, EXISTS condition, WHILE loop, BREAK command, CONTINUE command, WHILE loop to search through a table, transact---SQL wild card operators, COMPUTE command, Date conversion, SET commands.
20.	SQL * PLUS:- The buffer, DESCRIBE command, SHOW command, File commands, SAVE, GET, EDIT< Starting a file, spooling query output, SET commands, LOGIN.SQL file, CLEAR command, formatting your output, TITLE & BRITTLER, DEFINE, ACCEPT, NEW-VARIABLE, DUAL type, DECODE function, DATE conversions, Running a series of SQL files, Commentary SQL scripts, Advanced reports.
21.	Common mistakes/errors:- Table or view does not exist, invalid user name or password, FROM keyword not specified, Group function is not Allowed Here, Invalid column name, missing keyword, missing left parenthesis, missing right parenthesis, missing comma, column ambiguously defined, SQL command Not properly ENDED, Missing Expression, Not Enough Arguments for function, Not Enough values, Integrity constraint violated--- parent key not found, oracle not available, inserted value Too large for column, TNS; listener could not resolve SID Given in connect Descriptor, Insufficient privileges During Grants, Escape character in your statement--- invalid character, cannot create operating system file, common logical mistakes.