

SQL Server Developer (T-SQL) Course Content  
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### Implementing tables and views

1. Create and alter tables
  - a. Computed and persisted columns; schemas; scripts to deploy changes to multiple environments, for example, dev, test, production; manage permissions (GRANT, DENY, REVOKE)
2. Create and alter views
  - a. WITH ENCRYPTION; WITH SCHEMABINDING; WITH CHECK OPTION; manage permissions (GRANT, DENY, REVOKE)
3. Create and alter indexes
  - a. Filtered, included columns, unique, clustered, non-clustered, FILL FACTOR; CREATE STATISTICS; indexing views, compression
4. Create and modify constraints
  - a. PRIMARY KEY, FOREIGN KEY, UNIQUE, CHECK, cascading referential integrity, enabling/disabling, NOCHECK; SET IDENTITY\_INSERT
5. Implement data types
  - a. FILESTREAM; spatial, structured, and semi-structured; collations
6. Implement partitioning solutions
  - a. Partitioned tables and indexes (constraints, partition functions, partition schemes, MERGE, SPLIT, SWITCH); distributed partitioned views (constraints, linked servers)

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### Implementing programming objects

7. Create and alter stored procedures
  - a. Table-valued parameters (TVPs), EXECUTE AS, RECOMPILE, parameter direction (output); WITH ENCRYPTION; manage permissions (GRANT, DENY, REVOKE)
8. Create and alter user-defined functions (UDFs)

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- a. WITH SCHEMABINDING, EXECUTE AS; manage permissions (GRANT, DENY, REVOKE)
- 9. Create and alter DML triggers
  - a. INSERTED, DELETED, INSTEAD OF, EXECUTE AS
- 10. Create and alter DDL triggers
  - a. Enabling/disabling; return event data
- 11. Create and deploy CLR-based objects
  - a. Permission sets (SAFE, UNSAFE, EXTERNAL\_ACCESS), SET TRUSTWORTHY
- 12. Implement error handling
  - a. TRY/CATCH, RAISERROR, retrieving error information, custom error messages, @@ERROR
- 13. Manage transactions
  - a. BEGIN TRANSACTION, COMMIT, ROLLBACK, SET TRANSACTION ISOLATION LEVEL, named transactions

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Working with query fundamentals

- 14. Query data by using SELECT statements
  - a. LIKE, WHERE, ORDER BY, INTO
- 15. Modify data by using INSERT, UPDATE, and DELETE statements
  - a. Row constructors, DELETE FROM, UPDATE FROM, TRUNCATE TABLE
- 16. Return data by using the OUTPUT clause
  - a. INSERTED, DELETED, INTO
- 17. Modify data by using MERGE statements
  - a. INSERTED, DELETED, OUTPUT
- 18. Implement aggregate queries
  - a. Built-in aggregate functions, GROUPING SETS, GROUP BY, HAVING
- 19. Combine datasets

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- a. CROSS APPLY, OUTER APPLY, all join types; UNION, UNION ALL, INTERSECT, EXCEPT
20. Apply built-in scalar functions
- a. CAST and CONVERT; REPLACE; LEN and DATALENGTH; PATINDEX and CHARINDEX
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Applying additional query techniques

- 21. Implement sub-queries
    - a. Simple, correlated, scalar, list, table valued
  - 22. Implement CTE (common table expression) queries
    - a. Recursive, non-recursive
  - 23. Apply ranking functions
    - a. RANK, PARTITION BY, DENSE\_RANK, OVER, ROW\_NUMBER, NTILE
  - 24. Control execution plans
    - a. Table hints, query hints
  - 25. Manage international considerations
    - a. Collations, defining custom errors, filtering data, sort order, nvarchar, database collation, column collation
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Working with additional SQL Server components

- 26. Integrate Database Mail
- 27. Implement full-text search
  - a. CONTAINS, CONTAINSTABLE, FREETEXT, FREETEXTTABLE, STOPLIST
- 28. Implement scripts by using Windows PowerShell and SQL Server Management Objects (SMOs)
  - a. cmdlets
- 29. Implement Service Broker solutions

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- a. Services, queues, messages, message types, message validation, contracts, activation procedures, routes
  - 30. Track data changes
    - a. Change tracking; database audit specification; CHANGETABLE, Change Data capture
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Working with XML data

- 31. Retrieve relational data as XML
    - a. FOR XML
  - 32. Transform XML data into relational data
    - a. OPENXML, sp\_xml\_preparedocument, sp\_xml\_removedocument
  - 33. Query XML data
    - a. XQUERY, XPATH
  - 34. Manage XML data
    - a. XML datatype, XML indexes, XML schema collections
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Gathering performance information

- 35. Capture execution plans
  - a. Graphical execution plans; SHOWPLAN, index details in Query Plans
- 36. Gather trace information by using the SQL Server Profiler
- 37. Collect output from the Database Engine Tuning Advisor
  - a. Prepare a workload
- 38. Collect information from system metadata (DMV's and Catalog Views)