



Western Technical College
10152118 Applied SQL
Course Outcome Summary

Course Information

Description	This is a fundamental course in database concepts, design and implementation, for students in the Web & Software Developer Program. Students will utilize Microsoft Access to develop a general understanding and reference for relational database creation and querying. Students will then learn Structured Query Language (SQL) and utilize a database Server to create tables, write queries, and update relational databases. SQL transactions and procedures will also be implemented.
Career Cluster	Information Technology
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	72

Textbooks

SQL: Visual Quickstart Guide. 3rd Edition. Copyright 2008. Fehily, Chris. Publisher: Pearson. **ISBN-13:** 978-0-321-55357-7. Optional. (eBook <https://www.vitalsource.com/products/sql-chris-fehily-v9780132089470?term=9780321553577>).

Learner Supplies

Online Subscription fee of approximately \$75. **Vendor:** To be discussed in class. Required.

Success Abilities

1. Cultivate Passion: Enhance Personal Connections
2. Cultivate Passion: Expand a Growth-Mindset

3. Cultivate Passion: Increase Self-Awareness
4. Live Responsibly: Develop Resilience
5. Live Responsibly: Foster Accountability
6. Refine Professionalism: Act Ethically
7. Refine Professionalism: Improve Critical Thinking
8. Refine Professionalism: Participate Collaboratively
9. Refine Professionalism: Practice Effective Communication

Course Competencies

1. Explore relational database concepts.

Assessment Strategies

- 1.1. Lab
- 1.2. Quiz
- 1.3. Exam

Criteria

You will know you are successful when

- 1.1. you explain several of the problems databases solve.
- 1.2. you distinguish tables, columns, rows, primary and foreign keys in an existing design.
- 1.3. you build tables, columns, rows, primary and foreign keys in your own design.

Learning Objectives

- 1.a. Discuss problems databases can solve
- 1.b. Explore occupations that use databases.
- 1.c. Differentiate between data and information.
- 1.d. Identify tables, columns, rows, primary and foreign keys.
- 1.e. Discuss the data modeling process.

2. Examine fundamental relational database objects.

Assessment Strategies

- 2.1. Lab
- 2.2. Quiz
- 2.3. Exam

Criteria

You will know you are successful when

- 2.1. you design and build a database to 3NF given a set of requirements.
- 2.2. you design and build a database to 3NF using your own requirements.
- 2.3. you implement tables, keys, and relationships in your design.

Learning Objectives

- 2.a. Locate tables, keys, and relationships in a database.
- 2.b. Discuss how tables represent business entities.
- 2.c. Discuss how columns represent attributes of business entities.
- 2.d. Discuss how rows represent entries into a table for a business entity.
- 2.e. Examine primary key selection.
- 2.f. Examine foreign key selection.

3. Use a server based database management system (DBMS).

Assessment Strategies

- 3.1. Lab
- 3.2. Quiz
- 3.3. Exam

Criteria

You will know you are successful when

- 3.1. you query a server.
- 3.2. you design a database on a server.
- 3.3. you utilize a client side tool to work with a server.

Learning Objectives

- 3.a. Explore the client-server database model.
- 3.b. Use an enterprise database solution.
- 3.c. Query the database.
- 3.d. Design the database.
- 3.e. Manage the database.

4. Create relational databases using Entity Relationship Diagrams (ERD).

Assessment Strategies

- 4.1. Lab
- 4.2. Quiz
- 4.3. Exam

Criteria

You will know you are successful when

- 4.1. you model database design requirements using an ERD.
- 4.2. you use crow's feet notation to represent cardinality.
- 4.3. you illustrate primary and foreign key constraints on an ERD.

Learning Objectives

- 4.a. Model relationships for a business using ERD.
- 4.b. Use crows feet notation to represent cardinality.
- 4.c. Define table's columns, primary keys, and foreign keys.
- 4.d. Interpret business requirements to construct an ERD.

5. Design and implement normalized databases to the 3rd normal form.

Assessment Strategies

- 5.1. Lab
- 5.2. Quiz
- 5.3. Exam

Criteria

You will know you are successful when

- 5.1. you explain the importance and reasons for normalization.
- 5.2. you build a database to the 3rd normal form.
- 5.3. you identify and correct normal form violators.

Learning Objectives

- 5.a. Identify the importance of normalization.
- 5.b. Iterate through the first, second, and third normal forms.
- 5.c. Identify and resolve normal form violators.

6. Develop Structured Query Language (SQL) statements to create, read, update, and delete data (DML).

Assessment Strategies

- 6.1. Lab
- 6.2. Quiz
- 6.3. Exam

Criteria

You will know you are successful when

- 6.1. you write SQL statements to query a database.

- 6.2. you write SQL statements to filter data.
- 6.3. you write SQL statements to summarize and group data.
- 6.4. you write SQL statements to join table data.
- 6.5. you write SQL statements which utilize subqueries.
- 6.6. you write SQL statements to insert data.
- 6.7. you write SQL statements to update data.
- 6.8. you write SQL statements to delete data.

Learning Objectives

- 6.a. Explore SQL language statements and syntax.
- 6.b. Write SQL statements to insert data (create).
- 6.c. Write SQL statements to extract data (read).
- 6.d. Write SQL statements to delete data.
- 6.e. Write SQL statements update data.

7. Develop Structured Query Language (SQL) statements to define database objects (DDL).

Assessment Strategies

- 7.1. Lab
- 7.2. Quiz
- 7.3. Exam

Criteria

You will know you are successful when

- 7.1. you write SQL statements to create tables.
- 7.2. you write SQL statements to define primary keys.
- 7.3. you write SQL statements to define foreign keys.
- 7.4. you write SQL statements to define check constraints.

Learning Objectives

- 7.a. Create tables using SQL.
- 7.b. Create indexes using SQL.
- 7.c. Define constraints using SQL.
- 7.d. Define primary and foreign keys using SQL.

8. Explore indexing for efficiency.

Assessment Strategies

- 8.1. Lab
- 8.2. Quiz
- 8.3. Exam

Criteria

You will know you are successful when

- 8.1. you build an index to improve query performance.
- 8.2. you examine query performance.
- 8.3. you utilize a tool and SQL to create indices.

Learning Objectives

- 8.a. Improve query performance using indexes.
- 8.b. Create indexes using SQL.
- 8.c. Discuss issues related to indexes.
- 8.d. Examine query performance to determine if an index improves performance.

9. Implement database views.

Assessment Strategies

- 9.1. Lab
- 9.2. Quiz
- 9.3. Exam

Criteria

You will know you are successful when

- 9.1. you build views to represent SQL queries.
- 9.2. you build views to secure data.
- 9.3. you build views to simplify data access.

Learning Objectives

- 9.a. Create views to represent queries in the database.
- 9.b. Create views to reuse SQL queries.
- 9.c. Create views to secure data.
- 9.d. Create views to simplify access to data.

10. Explore database transactions.

Assessment Strategies

- 10.1. Lab
- 10.2. Quiz
- 10.3. Exam

Criteria

You will know you are successful when

- 10.1. you define why transactions are needed.
- 10.2. you examine situations which require locking data.
- 10.3. you utilize database isolation levels to avoid transaction issues.

Learning Objectives

- 10.a. Define transactions.
- 10.b. Discuss reading and locking data.
- 10.c. Explore potential transaction issues (i.e. dirty reads)
- 10.d. Explore database isolation levels.

11. Write basic stored procedures.

Assessment Strategies

- 11.1. Lab
- 11.2. Quiz
- 11.3. Exam

Criteria

You will know you are successful when

- 11.1. you develop basic functions and procedures.
- 11.2. you utilize triggers.
- 11.3. you utilize basic programming concepts.

Learning Objectives

- 11.a. Identify the purpose of using a stored procedure in SQL.
- 11.b. Identify reasons for writing code in the database.
- 11.c. Write code in the database.
- 11.d. Identify basic programming concepts.
- 11.e. Create functions and procedures.
- 11.f. Explore triggers.