STRANDS AND STANDARDS
Database Development

Course Description

This course is designed to educate students on the fundamentals of database and to provide introductory knowledge of and skills with database, including relational databases using SQL. This course will provide students with the necessary skills to pursue academic and professional opportunities.

Intended Grade Level	10-12
Units of Credit	1.0
Core Code	35-02-00-00-021
Concurrent Enrollment Core Code	35-02-00-13-021
Prerequisite	Introduction to Information Technology, Computer Science Principles
Skill Certification Test Numbers	860, 944
Test Weight	1.0
License Type	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Cybersecurity
Endorsement 2	Information Technology Systems

STRAND 1

Students will be introduced to Database Fundamentals.

Standard 1

Ethics of Database.
- Identify ethics within the industry.
- Identify personal ethics.

Standard 2

History of Databases.
- Order of database management systems in history (DBMS, RDBMS, OODBMS, ORDBMS).
- Understand what a relational database is.
- Understand the need for relational data management systems (RDMS).

Standard 3

Database industry aware of opportunities.
- Identify career opportunities in the database industry (DBA, programmer, reporting programmer, database designer, and database developer).

Standard 4

Types of Databases used today and where they are moving to in the future.
- Show understanding of the difference between OLTP vs Reporting.
- Data Lakes/reservoirs

STRAND 2

Students will be familiar with the languages types of database development.

Standard 1

DCL (Data Control Language).
- Grant rights to database objects.
- Revoking rights to database objects.

Standard 2

DDL (Data Definition Language).
- Create a database.
- Create objects in a database.
- Maintenance of the database and objects.
- Remove database objects

Standard 3

DML (Data Manipulation Language).

- Create the data in the database.
- Read the data in the database.
- Update the data in the database.
- Remove the data in the database

STRAND 3

Students will demonstrate the creation of a Logical ERD model and taking it to the physical database.

Standard 1

Students will show an understanding of the 5 levels of Normal Form.

- Differences between Data Marts (DM) vs Online Transactional Process (OLTP) databases.
- Understand each level and why 3NF is used in the industry for OLTP databases.
- Understand why 2NF is used in the industry for DM databases

Standard 2

Create an ERD (Entity Relationship Diagram).

- Demonstrate knowledge of one-to-one, one-to-many, and many-to-many relationships.
- Create attributes for the entities.
- Understand the reasons for keys in database.
- Understand choosing appropriate primary keys.
- Understand selecting appropriate data types for keys.
- Understand selecting appropriate fields for composite keys.
- Understand the relationship between foreign and primary keys.

Standard 3

Create database tables.

- Create database tables using proper ANSI SQL syntax.
- Define primary keys, foreign keys, unique keys, columns and rows.
- Choose data types and understand why they are important for storage requirements.
- Identify violations of data-integrity rules.

Standard 4

Create views and understand views and their benefits.

- Create a view for query using SQL or another graphical designer.
- Understand views.
- Understand when to use views.

Standard 5

Create indexes.

- Understand clustered and non-clustered indexes.
- Add, delete and manage indexes for fast access to table rows and enforcing certain constraints.
- Explain benefits and costs of using indexes.

STRAND 4

Demonstrate use of data manipulation language to view, change, create and remove data in the database.

Standard 1

Demonstrate select statements to view data in the database.

- Demonstrate simple one table selects.
- Demonstrate joined tables using inner and outer joins.
- Understand what a Cartesian product is and how to avoid creating one.
- Demonstrate grouping and sorting in joins.
- Demonstrate the use of inline functions in SQL.
- Check for NULL values.

Standard 2

Demonstrate insert statements to load data into the database.

- Demonstrate inserting data into a table.
- Demonstrate order when inserting into parent/child tables.

Standard 3

Demonstrate update statements to change data.

- Demonstrate updating one row updates.
- Demonstrate multiple rows to full table updates.

Standard 4

Demonstrate delete statements to remove data.

- Demonstrate deleting one row.
- Demonstrate deleting multiple rows to full table deletes.
- Show understanding of the difference between truncate and delete.

STRAND 5

Database Security.

Standard 1

Understand database security concepts.
- Understand the need to secure a database.
- Understand what objects can be secured.
- Understand what objects should be secured, user accounts, and roles.

Standard 2

Understand database backups and restore.
- Understand various backup trips, such as full and incremental.
- Understand the importance of backups.
- Understand how to restore a database.

Performance Skills

- Understand Database Fundamentals.
- Know the language types of database development.
- Demonstrate the creation of a Logical ERD model and taking it to the physical database.
- Demonstrate use of data manipulation language to view, change, create and remove data in the database.
- Understand Database Security.

Workplace Skills

Workplace skills should be practiced and improved on daily in the classroom to help students become efficient and reliable employees.
- Communication
- Problem Solving
- Critical Thinking
- Dependability
- Accountability

Skill Certificate Test Points by Strand

Test Name	Test #	Number of Test Points by Strand										Total Points	Total Questions
		1	2	3	4	5	6	7	8	9	10		
Database Development	860	4	4	10	16	5						39	30