

IT-2351: ENTERPRISE DATABASE SYSTEMS

Cuyahoga Community College

Viewing: IT-2351 : Enterprise Database Systems

Board of Trustees:

October 2023

Academic Term:

Fall 2024

Subject Code

IT - Information Technology

Course Number:

2351

Title:

Enterprise Database Systems

Catalog Description:

Design, develop and normalize a Structured Query Language (SQL) database to 3rd normal form using appropriate diagrams and database objects. Retrieve, insert, update, delete, troubleshoot, and report data from complex SQL databases for data cleansing, mining, and analysis.

Credit Hour(s):

4

Lecture Hour(s):

3

Lab Hour(s):

2

Requisites

Prerequisite and Corequisite

IT-1025 Information Technology Concepts for Programmers; IT-1050 Programming Logic; and MATH-0955 Beginning Algebra, or MATH-0990 Math Literacy for College Students, or qualified Math placement.

Outcomes

Course Outcome(s):

Apply knowledge of data migration, data warehousing, data mining, distributed databases, and security to design, develop and normalize a SQL database to 3rd normal form using appropriate diagrams and database objects.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Describe the relational approach to databases using diagrams to show various join types and their outcomes.
2. Articulate and present a database model including business rules, implementation of business rules in database design, the normalization process (including appropriate diagrams), complex data inquiries, database maintenance and migration issues.
3. Prepare dependency diagrams that properly represent the break down of dependencies through the normalization process in a complex database (5 or more tables).
4. Normalize a databases with at least 5 tables through 3rd normal form and explain normalization through fifth normal form while adhering to the defined business rules.
5. Display an understanding of the various types of dependencies: full, partial and transitive through implementation of a database project.
6. Create database objects using SQL that represent pre-defined business rules and a detailed normalization process.
7. Design and formulate constraints derived from business rules which have been implemented in entity relationship diagrams.
8. Explain the difference between constraints and triggers in the creation and implementation of a complex database.

9. Analyze database selection, implementation, administration, and security processes for distributed databases.
10. Explain the process of data migration in relationship to data warehousing, data mining and necessary security measures.

Course Outcome(s):

Retrieve, insert, update, delete, troubleshoot and report data from complex SQL databases.

Objective(s):

1. Retrieve, insert, update, and delete data using Data Definition Language, Data Retrieval Language and Data Manipulation Language statements as a part of the creation of a complex database (5 or more tables) that adheres to business rules.
2. Implement functions in SQL statements to represent data as defined by business rules and ad hoc situations.
3. Use commands to explore data dictionaries to troubleshoot complex databases.
4. Assimilate data using grouping statements in response to business inquiries.
5. Implement Join and Set Operations to prepare normalized data for reporting.
6. Properly implement joins including equi-joins, outer-joins and self-joins in a complex database to represent data from multiple tables or, copies of the same table.
7. Produce subqueries to represent multifaceted database outcomes.

Methods of Evaluation:

1. Hands-on Lab Exercises
2. Quizzes
3. Exams
4. Class Participation
5. Semester Project

Course Content Outline:

1. Concepts
 - a. Dependencies
 - b. Normalization
 - c. Third normal form
 - d. Fifth normal form
 - e. Business rules
 - f. Database objects
 - g. Constraints
 - h. Triggers
 - i. Functions
 - j. Data dictionary
 - k. Relational database
 - l. Tables
 - m. Data redundancy
 - n. Data integrity
 - o. Distributed database
 - p. Data migration
 - q. Data warehousing
 - r. Data mining
 - s. Security
 - t. Database modeling
 - u. Database design
 - v. Database maintenance
 - w. Database selection
 - x. Database administration
 - y. Datatypes
 - z. Query
- aa. Nested queries
- bb. Data manipulation

- cc. Data control
 - dd. SQL commands
 - ee. Programming concepts
2. Skills
- a. Prepare dependency diagrams
 - b. Create entity relationship diagrams
 - c. Normalize a database to 3rd normal form
 - d. Retrieve, insert, update, delete and report data
 - e. Troubleshoot complex database
 - f. Create and revise SQL objects
3. Issues
- a. Constraints
 - b. Data integrity
 - c. Data redundancy
 - d. Security
 - e. Migration

Resources

Murach, Joel. *Murach's MySQL*. 3rd ed. Fresno, CA: Mike Murach & Associates, Inc., 2019.

Shields, Walter. *SQL Quick Start Guide*. Albany, NY: ClydeBank Media LLC, 2019.

Coronel, Carlos and Steve Morris. *Database Systems: Design, Implementation & Management*. 14th ed. Boston, MA: Course Technology, 2022.

Kroenke, David. *Database Processing: Fundamentals, Design and Implementation*. 14th ed. Upper Saddle River, NJ: Pearson Education, Inc., 2019.

Shellman, Mark, Hassan Afyouni, Philip J. Pratt, and Mary Z. Last. *A Guide to SQL*. 10th ed. Detroit: South-Western, Cengage Learning, 2021.

Resources Other

1. w3schools.com: <https://www.w3schools.com/sql/default.asp>
2. <https://www.sqltutorial.org/>
3. <https://www.geeksforgeeks.org/sql-tutorial/>
4. Database normalization: <https://www.guru99.com/database-normalization.html>

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