CSIT 254
Emerging Database Design
4 Credits

Community College of Baltimore County
Common Course Outline

Description

CSIT 254 – Emerging Database Design: expands upon relational database design principles, techniques, and emerging technologies to design and develop complex databases using database management software (DBMS). Topics include an overview of database modeling, cloud-based databases, Big Data, and Big Data management.

Pre-requisites: Grade of C or better in CSIT 154 or CSIT 156, or permission of the Program Coordinator

Overall Course Objectives

Upon completion of this course, students will be able to:

1. identify database design constraints based on the process of requirements elicitation;
2. transform design requirements into Entity Relationship Diagrams (ERDs);
3. normalize the logical design of the database;
4. determine database attributes and their properties within each entity;
5. determine primary and foreign keys;
6. determine relationships and their cardinality;
7. implement integrity constraints;
8. build a database by interpreting an entity relationship diagram;
9. enforce referential integrity constraints in the database design;
10. create tables and queries;
11. implement security measures and grant permissions to database;
12. apply backup and recovery techniques to a database;
13. demonstrate use of Extensible Markup Language (XML);
14. create documentation and basic user training materials for databases;
15. demonstrate use of computer-aided software engineering (CASE) tools;
16. describe challenges, uses, and implementation for Big Data;
17. discuss various cloud computing database architectures and implementations;
18. demonstrate use of Big Data analytics;
19. describe non-SQL (NoSQL) databases; and
20. discuss data mining algorithms.

Major Topics

I. Determining database design requirements
II. Computer-aided software engineering tools
III. Database modeling concepts
    a. Entity relationship diagrams

The Common Course Outline (CCO) determines the essential nature of each course.
For more information, see your professor's syllabus.

         b. Keys
         c. Relationships
         d. Cardinality
         e. Integrity constraints
         f. Referential integrity

IV. Normalization
V. Database implementation
         a. Creating tables
         b. Creating queries and views
VI. Security measures and permissions
VII. Backup and recovery
VIII. XML
IX. Cloud architectures, services, and models
X. Introduction to Big Data
XI. Overview of Big Data analytics
         a. Big Data management
         b. Non-SQL (NoSQL) databases
XII. Introduction to Data Mining
XIII. Documentation

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- One comprehensive project
- Two exams
- Eight quizzes
- Five projects

Written assignments and research projects: Students are required to use appropriate academic resources in their research and cite sources according to the style selected by their professor.

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