CSE 4020 Database Systems (3 credits)

Primary instructor: Philip Bernhard

Textbooks and references:

A. Silberschatz, H. F. Korth, and S. Sud, Database System Concepts. McGraw-Hill, 2011. (T)

Course information:

2014–2015 Catalog description: CSE 4020 Database Systems (3 credits). Introduces the fundamentals of computer database systems. Includes a review of file structures, concepts of database design, functional units of a typical database system and application of database concepts to real-world problems. Prerequisites: CSE 2010 or ECE 2552.

Prerequisites by topic: Use algorithmic paradigms; explain efficiency measures, rates of growth, and asymptotic behavior; use data processing algorithms; explain graph theory and graph theoretic algorithms; implement and use basic data structures

Place in program: Advanced elective

Course outcomes & related student outcomes: The student will be able to

1. Describe the various software components of a database management system. (1: Fundamental knowledge)
2. Develop eutity-relationship data models for database applications. (2: Scientific, computing, and engineering problem solving)
3. Convert entity-relationship data models to relational databases. (4b: Satisfaction of requirements)
4. Develop relational database queries in abstract query languages, including relational algebra and tuple calculus. (4b: Satisfaction of requirements)
5. Develop relational database queries in Structured Query Language (SQL). (4b: Satisfaction of requirements)
6. Define levels of normalization (1st, 2nd, 3rd, and BCNF), and explain why they are important. (4b: Satisfaction of requirements)
7. Design a normalized relational database. (4b: Satisfaction of requirements)
8. Implement a real relational database, load it with data, and execute queries on that database using a commercial relational database management system. (3: Skillful use of tools)

Topics covered:

1. Introduction to the field and application of database systems (3 hours)

2. Entity-relationship modeling (10 hours)
3. Relational query languages (10 hours)
4. Database design (10 hours)
5. Database implementation (5 hours)

Approved by: Phil Bernhard, Associate Professor

Signature: _____ **Date:** 1/30/15