George Mason University

Department of Computer Science

CS 450: Database Concepts

Spring 2018

Prof. Ami Motro

Description

This upper-level undergraduate course is an introductory course in the area of databases, with a focus on *database models and languages*. Topics to be covered include: database design with the Entity-Relationship model, the relational data model and its algebra, SQL and database programming, and the theory of relational database design; additional topics will be covered as time permits.

Course Outcomes

1. Knowledge of fundamental concepts of file and database management.
2. Knowledge of database design principles, and ability to model real-world environments using the ER model.
3. Knowledge of the formal principles of the relational database model and its query languages, and ability to design relational databases and express queries in the relational algebra and calculus.
4. Knowledge of the Structured Query Language (SQL) and database programming principles, and ability to author SQL queries and implement Java database applications using the Oracle database system.
5. Knowledge of the basic principles of the mathematical theory of database design, and ability to design databases that adhere to Boyce-Codd Normal Form.
6. Experience in the complete database creative process: from database design, to database constuction, to database programming.

Time and Place

Tuesday, Thursday 1:30-2:45, Sandbridge 107

Instructor

Dr. Ami Motro
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Teaching Assistant

TBA
Office hours:TBA
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Prerequisites

Grade of C or better in CS 310 (Data Structures) and CS 330 (Formal Methods and Models).
Specifically, good background in

1. Discrete mathematics (e.g., set theory and mathematical logic)
2. Programming (good knowledge of Java)
3. Data structures and algorithms
4. Computer architecture and operating systems

Prerequisites are strictly enforced!

Requirements

Three exams and seven homework assignments and projects, most requiring computer work.
The final grade will be based on exams (75%) and homework assignments (25%).

Textbooks

Comprehensive instructor notes ("slides") will be made available. These two books are recommended for further reading:

1. *Database Systems - An Application-Oriented Approach, Introductory Version, 2nd Edition*
   Kifer, Bernstein, and Lewis
   Addison-Wesley/Pearson, 2004
   ISBN-10: 0321228383
   ISBN-13: 9780321268457
2. *Oracle 10g Programming: A Primer*
   Sunderraman
   Addison-Wesley, 2008
   ISBN-10: 0321463048
   ISBN-13: 978-0321463043
