

EECS 647 Introduction to Database Systems

Instructor:

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Catalog Listing:

Introduction to the concept of databases and their operations. Basic concepts, database architectures, storage structures and indexing, data structures: hierarchical, network, and relational database organizations. Emphasis on relational databases and retrieval languages SQL, QBE, and ones based on relational algebra and relational calculus; brief description of predicate calculus. Theory of databases, normal forms, normalization, candidates keys, decomposition, functional dependencies, multivalued dependencies. Introduction to the design of a simple database structure and a data retrieval language.

Prerequisites: EECS 448

Class Objectives:

- To learn the fundamentals of good database design.
- To be able to write SQL queries of moderate complexity
- To be able to create a web front end to a database application
- To gain an understanding and hands-on experience with the file management techniques used by database systems.

Text Book:

Fundamentals of Database Systems, Elmasri & Navathe, Fifth Edition, Addison-Wesley, 2004. ISBN: 0-321-36957-2.

Grading:

Take home background survey	1pt
Homework: 6 homework	30pts
Quizzes: 6 in classes quizzes	4pts
Final Project: one team project	25pts
Midterm Exam: one midterm	15pts
Final Exam: one final	25pts

Total: 100pts

The single lowest score is automatically dropped in calculating final homework and quiz scores.

We will use the following scale to assign final grades (tentative and curving will be used):

A:	over		90%
B:	80%	-	89%
C:	70%	-	79%
D:	60%	-	69%
F:	below 60%		

Attendance:

I expect you to come to lectures on a regular basis and will generally be unwilling to answer questions about material covered in a class you missed (unless you were sick or had another legitimate excuse). You are responsible for all announcements made in class. Participation is encouraged; please feel free to stop me if you do not understand something that has been said.

Extra Credit:

Extra credits will be given to creativity and/or additional efforts shown in the team project and exams. Details will be given in the related assignments.

Late Assignments:

Unless you have a previously approved excuse, the submission of late assignments is strongly discouraged. Late penalties: you lose 25% of your scores if the assignment was delayed by one day, 50% for two days, and 75% for three days. No late assignment will be accepted after three days.

Academic Misconduct:

The department, school and university have very strict guidelines regarding academic misconduct. Obviously, copying is not allowed on exams. Students are expected to submit their own work on individual programming projects. Lending or borrowing all or part of a program from another student is not allowed. Students ARE allowed to borrow and modify any code on this class web site in their labs or programming projects. Instances of cheating will result in a loss on one letter grade in the course and referral to the department chairman and the dean of engineering. If a second case of academic misconduct is reported in any class, a dismissal hearing may be initiated by the dean of engineering.

Topics Covered (subject to change during the course):

Chapter 1: Databases and Database Users

Chapter 2: Database Systems Concepts and Architecture

Chapter 3: Data Modeling Using the Entity-Relationship Model

Chapter 5: The Relational Data Model and Relational Database Constraints

Chapter 6: Sections 6.1 - 6.5, Relational Algebra

Chapter 7: Relational Database Design by ER- and EER-to-Relational Mapping

Chapter 10: Functional Dependencies and Normalization for Relational Databases

Chapter 11.3: Fourth Normal Forms

Chapter 8: SQL-99: Schema, Definition, Basic Constraints and Queries

Chapter 9: More SQL: Sections 9.1 - 9.3

Chapter 12.2: The Database Design and Implementation Process

Chapter 13: Disk Storage, Basic File Structures, and Hashing

Chapter 14: Indexing Structures for Files

Chapter 15: Sections 15.1 - 15.7 (especially 15.3, 15.4, 15.7)

Chapter 17: Introduction to Transaction Processing Concepts and Theory (exclude 15.6)

Chapter 18: Concurrency Control Techniques

Chapter 19: Database Recovery Techniques