

# 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 basic knowledge of data mining
- To gain an understanding and hands-on experience with the file management techniques used by database systems.

## Text Book:

*Database Management Systems*, Raghu Ramakrishnan, Johannes Gehrke, 3rd ed., McGraw-Hill Higher Education, ISBN: 0-07-246563-8 Available at KU Student Stores.

## Grading:

Take home background survey	1pt
Homework: 5 homework	20pts
Quizzes & Class Participation	5pts
Final Project: one team project	20pts
Two Midterm Exams:	30pts

Final Exam: one final	24pts
Total:	100pts

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. While you are in classroom, please show courtesy to your classmate. You are responsible for all announcements made in class. Generally I will be unwilling to answer questions about material covered in a class you missed (unless you were sick or had another legitimate excuse). Class participation is strongly encouraged.

### **Late Assignments:**

There are two types of assignments, written and programming, in this course. 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.

### **Exam Policy**

All exams are closed book, closed notes, and will be held in class. No calculators, cell phones, head phones, or electronic devices of any sort will be allowed. No such devices should be out in the open.

You must write legibly and show all your work clearly for credit. Partial credit will only be given to meaningful answers. You will be graded according to your approach to the problems, mathematical rigor, and quality of your solutions.

If you come in late after an exam has already begun, you will not be allowed any extra time to complete your exam.

### **Homework/project:**

Unless otherwise stated, all material from (a) the assigned readings, (b) lecture notes, and (c) assignments are fair game for exams.

Occasionally you may not understand why points have been deducted from your assignment or exam. If so, you should come to see us. We will reconsider your whole

assignment, or exam, if, and only if, you contact us within 5 days after it has been returned in class. No assignment, or exam, will be re-graded after it has been returned for more than 5 days, regardless of whether you were in class that day or not.

We are not responsible for any assignment, or exam, that you do not pick up after they have been returned in class. Keep all copies of your work. If you dispute any score recorded, you must bring in your original work for verification in order to have it changed.

**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 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):**

Databases and Database Users

Database Systems Concepts and Architecture

Data Modeling Using the Entity-Relationship Model

Relational Data Model and Relational Database Constraints

Relational Algebra

Relational Database Design by ER- and EER-to-Relational Mapping

Functional Dependencies and Normalization for Relational Databases

Fourth Normal Forms

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

The Database Design and Implementation Process

Disk Storage, Basic File Structures, and Hashing

Indexing Structures for Files

Introduction to Transaction Processing Concepts and Theory (exclude 15.6)

Concurrency Control Techniques

Data Mining