



# CS 306 Database Systems

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2022-2023 Fall Syllabus

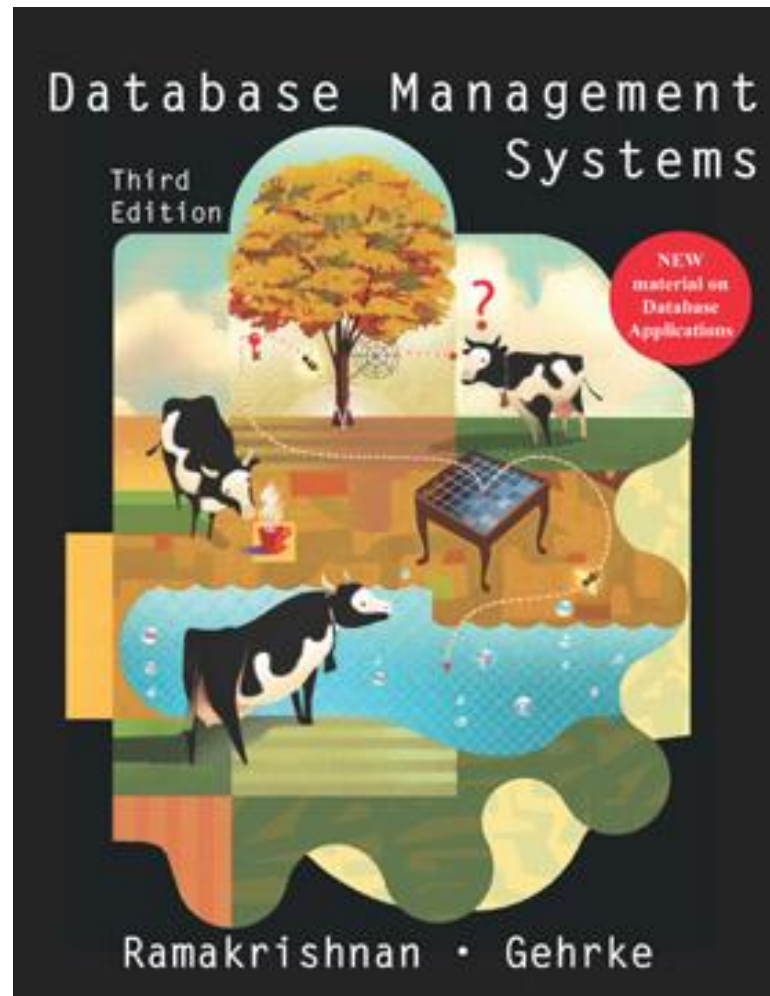


# GENERAL INFORMATION

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- Email : [elif.koc@sabanciuniv.edu](mailto:elif.koc@sabanciuniv.edu)
- Please email me if you have any question
- Use sucourse for discussions regarding the course.  
(Your TAs will check the messages regularly and inform me for any urgent matter)

# GENERAL INFORMATION : Text Book





# Grading Policy

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- There will be a Midterm and a Final :
  - MT -30% (exact day and time TBA)
  - FINAL - 35% (exact day and time TBA)
- DB Application Project: 25%
  - Group project (max 4 students).
  - Choose different projects, or variations.
  - You may use the MySQL or any other Database Management System
- QUIZes - 10%

There will be 15-20 Quizes, 1% each  
So you will get 10% easily. If you exceed 10%, then I will see what to do with the extra points :)



# Makeup Policy

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- One comprehensive makeup for MT or Final



# Learning objectives

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- Learning how to **design and implement** a database application
  - Conceptual design
  - Relational Model
  - Mapping ER to Relational Model
  - Schema refinement and normal forms
  - Querying
- Learning **database system** concepts
  - Concurrency Control and Transaction Management
  - Recovery
  - Storage and Indexing
- Learning new generation data storage and querying (**and also understanding that the conventional SQL databases are not obsolete**)



# List of Topics

(Order of teaching may be slightly different)

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- Introduction to Database Systems
- Entity Relationship Model
- Relational Model
- Relational Algebra
- SQL Queries



# List of Topics (Contd.)

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- Functional Dependencies
- Normal Forms
- Schema Decomposition into Normal Forms





# List of Topics (Contd.)

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- Data Storage and Indexing
- Transaction Management
- Concurrency Control
- Crash Recovery



# List of Topics (Contd.)

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- NoSQL Databases and Key-Value Stores
- Graph Database Model

FINAL and Makeup will cover all the topics including NoSQL and Graph Database Model



# PROJECT

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- Form your group (Max 4 people)
- Think about a real-life database application project
- ⑩ Step 1: Write a one page report describing what you want to do for this project. Write your report using any editor and submit the PDF through sucourse
- ⑩ Report should list the group members but **only one student should submit the report.**
- ⑩ If you submit you will get 0
- ⑩ Otherwise you will get -1

# An example database application



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(Taken from the book “Fundamentals of Database Systems” by Elmasri and Navathe)

**Company** database keeps track of a company’s employees, departments and projects.

1. The company is organized into departments. Each department has a unique name, a unique number and a particular employee who manages the department. We keep track of the start date when that employee began managing the department. A department may have several locations.
2. A department controls a number of projects, each of which has a unique name, a unique number and a single location.
3. We store each employee’s name, Social Security number, address, salary, sex and birth date. An employee is assigned to one department but may work on several projects, which are not necessarily controlled by the same department. We keep track of the number of hours per week that an employee works on each project. We also keep track of the direct supervisor of each employee.
4. We want to keep track of the dependents of each employee for insurance purposes. We keep each dependent’s first name, sex, birth date and relationship to the employee.



# Learning objectives

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- Learning how to **design and implement** a database application
  - Conceptual design (ER model)
  - Relational Model
  - Mapping ER to Relational Model
  - Schema refinement and normal forms
  - Querying (SQL)
- Learning **database system** concepts
  - Concurrency Control and Transaction Management
  - Recovery
  - Storage and Indexing



# What you need to do:

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- Don't hesitate to ask questions or contribute with your comments during the lectures (or email me)
- Work harmoniously for the group project
- Pass this course with a good grade!
  - You need to collect min 50 out of 100 points
  - Please take advantage of the midterm, final and makeup are a bit harder.