

CISC637 Database Systems, Spring 2015

Time: TR 11:00am–12:15pm
Location: 329 Purnell
Web page: Sakai (<http://sakai.udel.edu>)
Professor: Ben Carterette (carteret@cis.udel.edu)
Office: 440 Smith Hall
Office hours: TR 3:30pm–4:30pm, or by appointment

The course web page will be the primary source of information about the course. There you will find homeworks, a course schedule, slides, and additional resources. Please check it often.

Course Objectives

The main objective of this course is to give you the tools to turn enterprise business requirements into a functional, well-designed database with interfaces for end-user access. By the end of the course, you will be able to:

- model data as sets of relationships between entities;
- create well-designed databases for hundreds of thousands to millions of records (gigabytes of data);
- use the SQL query language to search and process data in a database;
- build applications for end-user access to a database;
- use relational algebra to describe and optimize query processing;
- reason about data models and algorithms for billions of records (terabytes of data).

Textbook: *Database System Concepts*, 6th or 7th edition, by Silberschatz, Korth, and Sudarshan.

Tentative schedule:

Week starting	Topics	Assignments	Readings
Feb. 9	Relational model		Ch. 1, 2
Feb. 16	SQL	HW1	Ch. 3, 4.4
Feb. 23	E-R model; database design		7.1–7.5, 7.7–7.8
Mar. 2	Relational algebra & RDB design	HW2	7.6, 6.1–6.2, 8.1
Mar. 9	Normalization		8.1–8.5, 8.8
Mar. 16	More normalization; SQL programming	HW3	9.1, 5.1–5.3
Mar. 23	Midterm exam on Thursday Mar. 26		
Mar. 30	Spring break		
Apr. 6	App programming; disk storage	HW4	10.1, 10.5–10.6, 11.1–11.2
Apr. 13	Indexing	Project 1	11.6, 11.3, 11.10
Apr. 20	Query processing & optimization	HW5	12.1–12.7, 13.1–13.4
Apr. 27	Transactions	Project 2	13.5, 14.1–14.7
May 4	Concurrency control & recovery	HW6	15.1, 15.3, 16.1–16.5
May 11	Something interesting (I hope)	Final project	
May 26	Final exam, this room 10:30am		

Prerequisites: Equivalent to CISC220 (data structures) is required. Programming skills are a must.

Grading:

You will be graded on in-class activities, homeworks, and exams.

- 30%—Six homework assignments.
- 30%—Project.
- 20%—In-class activities.
- 10%—Midterm exam.
- 10%—Final exam.

Homeworks must be done alone. You may discuss questions with other students, but each student must turn in their own assignment in their own words. Homeworks will be submitted on Sakai and in your MySQL database on UD servers. In-class activities can be done in pairs or alone.

Project:

The project will involve designing and implementing a database application. You will be the database administrator, formulating and implementing schema in a DBMS; the applications programmer, writing the higher-level software that interfaces with the DBMS; and the end user that actually uses the application.

You will use the MySQL DBMS, a free open-source system that is available on UD servers. Details on how to log in and use MySQL will be provided. The application program will embed the database query language in a high-level language (such as Java, C++, Python, etc) of your choice, and the user must be able to interact with the application to get information from the database.

The project can be done alone or in pairs. More details will be posted to the course web page soon; stay tuned.

Letter Grades: Letter grades will follow the standard scale. Exams, homework, and the project will be graded on a curve.

Lateness Policy Assignments must be turned in at the beginning of class to be considered for full credit. Each day late will be penalized 10%; an assignment turned in ten days late will get zero credit.

Academic Honesty Policy All work you turn in must be your own. This includes code. While you may look at code you find on-line, you may not copy it for your project. Students caught submitting someone else's work (either another student's or answers found on the web) will receive zero credit and may be prosecuted according to the University guidelines.