

# CSCI 403: Database Management

## Winter/Spring 2008, M/W/F 3-4PM, 152 Alderson Hall

Yong Joseph Bakos  
205 Stratton Hall  
(303) 653-3017  
ybakos@mines.edu

**Office hours** are M/W/F 2 – 3PM and by appointment.

**Course Web home:** <http://mines.humanoriented.com/classes/2009/spring/csci403/>

**Prerequisite:** CSCI 262 Data Structures

**Texts:** SQL in a Nutshell. Kline, Kline, & Hunt. O'Reilly. 2007  
Fundamentals of Database Systems, 5<sup>th</sup> ed. Elmasri, Navathe. Addison-Wesley. 2007.

The required text is SQL in a Nutshell, which will serve as a handy reference throughout the course. Lectures and other materials are drawn from Fundamentals of Database Systems, but *do not* purchase this book.

### Course Objectives

The goal of this course is to understand and *to be able to apply* the basic concepts of modern database systems. Topics include:

- The entity-relationship model
- Relational data model, constraints, relational algebra
- Fundamental design principles and techniques of relational databases, eg, normalization.
- SQL
- Stored procedures, triggers
- Database programming
- File structures and indexes
- Fundamentals of administration, performance and optimization

### Grading

- Project 25%
- Midterm 25%
- Final 25%
- Homework 15%
- Attendance/Participation 10%

### Homework

There will likely be one homework assignment per week, with the goal of preparing you for the midterm and final. Late homework will not be accepted, except for unusual circumstances.

### Project

We will be engaged in a semester-long project designing, implementing, maintaining and using a relational database system. This is the most critical component in reaching our course objectives. Additional details will be provided during class.

## Exams

One midterm exam will be conducted the week of March 2 2009.

The final exam will be conducted during the week of May 4 2009.

A makeup examination can be arranged only when a student has an emergency (eg, medical emergency or urgent family matter). The student may be asked to provide the instructor with an appropriate document, such as a doctor's note.

## Accommodation

If you need certain accommodation based on disability, talk to the instructor in person so that appropriate arrangements can be made.

## Course Schedule

This schedule is not fixed in stone and is subject to change according to the actual progress of the course.

<b><u>Week</u></b>	<b><u>Lecture</u></b>	<b><u>Reading*</u></b>
1	Introduction, Basic Concepts	Ch 1
2	Basic Concepts, History, ER Model	Ch 2, 3
3	ER Model, Other Notations	Ch 3, 4
4	Relational Model, Relational Algebra	Ch 5, 6
5	SQL	Ch 8
6	ER-to-Relational Mapping, Design	Ch 7, 10
7	Database Design	Ch 10, 11
8	Database Design	Ch 12, 13
9	<b>Midterm</b> , Storage, Indexing	Ch 13, 14
10	(Spring Break)	
11	Database Programming (PHP, Java, .Net)	Ch 9
12	Database Programming (Hibernate, ActiveRecord)	
13	Transactions, Stored Procedures, Triggers	Ch 17, 18, 19
14	Security, System Architecture	Ch 23, 25
15	Performance, Data Mining, OLAP	Ch 15, 16, 28, 29
16	Problems, Trends, Postmodern Databases	Ch 27, 30
17	(Dead Week)	
18	Final Exam	

\* Chapters noted are from Fundamentals of Database Systems and are provided here merely as a guide.

## On Collaboration & Academic Integrity

Students are encouraged to discuss and collaborate as much as possible. However, it is obviously not acceptable to copy another student's solution. Your work must be your own. In addition, simply copying solutions found online is not acceptable. Be aware that homework assignments, project and midterm will not just focus on producing correct code, but explaining how things work.

Please see the Student Handbook for details on academic dishonesty. No exceptions will be made for students found simply giving away or taking another's solutions.

## Academic Integrity Pledge

I pledge to uphold the high standards of academic ethics and integrity expressed by the Colorado School of Mines Student Honor Code by which I am bound. In particular, I will not misrepresent the work of others as my own, nor will I give or receive unauthorized assistance in the performance of academic coursework. I understand that my instructor will report any infraction of academic integrity to the Department Head and that any such matter will be investigated and prosecuted fully.

Name (print): \_\_\_\_\_

Signature: \_\_\_\_\_