CSC/CPE 366: Database Modeling, Design and Implementation
Spring 2011
Course Syllabus

March 25, 2011

Instructor: Alexander Dekhtyar
email: dekhtyar@csc.calpoly.edu
office: 14-215

What	When		Where
Lecture	TR	8:10 – 9:30am	186-C200
Lab	MWF	9:10 – 11:00am	14-302
Final Exam	June 7 (Tuesday)	7:10 - 10:00am	186-C200

Office Hours

	When	Where
Tuesday	3:00pm - 4:00pm	14-215
Wednsday	9:00am - 12:00pm	14-215
Friday	3:00pm - 4:00pm	14-215

Additional appointments can be scheduled by emailing the instructor at *dekhtyar@calpoly.edu*.

Overview

This course will explore a variety of topics related to design and implementation of database applications. During the course, the students will learn the techniques for building relational database models for applications and tuning database design for best performance, will obtain experience in building an actual database application and will learn the basic concepts of object-oriented, object-relational and semistructured database models. Course labs will use Oracle DBMS.

Texbook

Required: *Database Systems: The Complete Book (3rd Edition)*, Jeffrey D. Ullman, Jennifer Widom, Hector Garcia-Molina, 2009, Prentice Hall.

Alternative: *A First Course in Database Systems (3rd Edition)*, Jeffrey D. Ullman, Jennifer Widom, 2007, Prentice Hall.

Topics

The following will be covered in the course.

No.	Topic	Duration (weeks)
1.	Introduction: Database Modeling	1
2.	Conceptual Modeling using Entity-Relationship models	2
3.	Database Tuning, Functional Dependencies, Theory of Normal Forms	2
	Midterm	Topics 1 – 3.
4.	Database Security	1
5.	Object-Oriented and Object-Relational Databases	1-2
6.	Semistructured Databases and XML	2
	Final Exam	Comprehensive

Most of the topics will be covered in the order specified above, but some variations are possible during the course.

Grading

Homeworks	5 - 15%
Labs and Project	35-45%
Midterm Exam	20 - 25%
Final Exam	25 - 30%

I give relatively hard problems and take points off on exams. Because of this, the traditional 90-A, 80-B, 70-C grading schema does not work in my classes. Historically, the A/B cutoff has been around 80-85%, while the B/C cutoff has been around 67-70%.

Course Policies

Exams

There will be one midterm exam and a comprehensive final exam.

The midterm exam date is *tentatively* set for either Tuesday, May 3 or Thursday, May 5.

Official date for the final exam June 7 (Tuesday), 7:10am.

Make-up exams will not be given, *unless there are extraordinary circumstances present and I am notified in advance.* The policy regarding the use of textbooks and notes will be announced at least one week prior to each exam. (Typically, I allow a single cheat sheet on all my exams).

Labs and project

Practical knowledge of the database modeling techniques and practical experience in building database applications will be conveyed through labs and the course project. There will be about 7-8 labs. Some labs will be standalone, while others will be part of the course project. The rough lab and project schedule is described below.

Week	Lab	Lab Type	Project
Week 1	Lab 1: SQL	*standalone, individual*	–
Weeks 2-5	Labs 2–5: Database Application design and tuning	*project, group*	Design stage
Week 6	Lab 6 : Security	*standalone*	Implementation Stage
Week 7	Lab 7 : ORDBMS	*standalone*	Implementation Stage
Weeks 8-10	Lab 8 : XML	*standalone*	Implementation, Evaluation, Testing Stage

Each lab assignment will span 2-4 lab sessions. Each lab assignment is due by the end of lab period on the due date (unless specified otherwise). You are welcome to work on the lab assignments outside the lab hours, however, **lab period attendance is mandatory**. *You may only leave the lab period (a) with the express permission of the instructor if (b) the current assignment is complete and the next assignment has not been made available yet.* Project-related lab assignments will be done by groups formed at the beginning of the course. Standalone lab assignments will either be individual or group – this will be stated on each assignment explicitly.

Project. This course will involve a quarter-long team project which will require each team to go through all the steps of database application modeling, design and implementation. The project will have an outside customer, and the goal of the project is to produce a working, *usable* prototype of the database application, which the customer can adopt, further extend and enhance after the delivery. At the beginning of the quarter, you will have opportunities to interact with the customer and learn about the application desiderata (requirements) from him. Throughout the course, you will have opportunity to consult the customer. This should allow you to fine-tune your application design to the customer needs.

While all groups will be working on the same project, I reserve the right to *individualize* the assignments of different groups. The specifical individualizations may involve language of implementation, added stress on certain features, or certain categories of users, use of advanced database modeling techniques (ORDBMS, XML).

Homeworks

In addition to labs, a number of paper-and-pencil homeworks will be assigned. Homeworks will typically consist of problems taken from database textbooks, or similarly styled problems. The primary purpose of the paper-and-pencil homeworks is preparation for exams. Not all homeworks (or not all problems in a given homework) may end up being graded.

Late Submissions

All assignments are due at classtime on the due date: homeworks - at the beginning of the class (with grace period extending to the beginning of the lab period); lab assignments - at the end of the lab period. Any deviations from these rules will be spelled out explicitly in the assignments.

Homework/lab assignments submitted later than indicated above will be considered *late submissions*.

If paper-and-pencil homework solutions are distributed on the due date of the homework, ***late homework submissions will not be accepted***. Otherwise, late homeworks can be submitted during next 24 hours for a 10-30% penalty (the exact amount will depend on the submission time and the specific circumstances). No homework submissions will be accepted afterwards.

Late lab assignment submissions can be turned in before or at the beginning of the next lab period for a 10-30% penalty (the exact amount will depend on the submission time and the specific circumstances[1]). No lab assignment submissions will be accepted after that.

Communication

The class will have an official mailing list. The email addresses for the sections are:

cpe-366-01-2114@calpoly.edu

I will typically post all announcements to both mailing lists at the same time.

I encourage questions during classtime and questions via email. My answers to email questions may be broadcast to the entire class via the mailing list, if the answer may be relevant to everyone (e.g. a correction in a text of a handout, or a clarification of a homework problem), and may also appear on the web page. The questions can also be posted to the mailing list directly. The mailing list will also be used for all annoucements related to the course. It is your responsibility to read your class-related email. Failure to read email posted to cs405001 mailing list cannot be used as an excuse in the class.

[1] The penalty will be larger if the gap between the two lab periods includes a weekend and smaller otherwise

Web Page

Class web page can be found at

http://www.csc.calpoly.edu/∼dekhtyar/366-Spring2011

Through this page you will be able to access all class handouts including homeworks, project information and lecture notes.

Class Wiki

Class wiki can be found at

https://wiki.csc.calpoly.edu/csc366-Spring2011/wiki

The wiki will be used as the student-run repository of information about the project. Additionally, you will use the wiki to submit all your project deliverables.

Academic Integrity

University Policies

Cal Poly's Academic Integrity policies are found at

http://www.academicprograms.calpoly.edu/academicpolicies/Cheating.htm

In particular, these policies define *cheating* as (684.1)

> "*. . . obtaining or attempting to obtain, or aiding another to obtain credit for work, or any improvement in evaluation of performance, by any dishonest or deceptive means. Cheating includes, but is not limited to: lying; copying from another's test or examination; discussion of answers or questions on an examination or test, unless such discussion is specifically authorized by the instructor; taking or receiving copies of an exam without the permission of the instructor; using or displaying notes, "cheat sheets," or other information devices inappropriate to the prescribed test conditions; allowing someone other than the officially enrolled student to represent same.*"

Plagiarism, per University policies is defined as (684.3)

> "... the act of using the ideas or work of another person or persons as if they were one's own without giving proper credit to the source. Such an act is not plagiarism if it is ascertained that the ideas were arrived through independent reasoning or logic or where the thought or idea is common knowledge. Acknowledgement of an original author or source must be made through appropriate references; i.e., quotation marks, footnotes, or commentary."

University policies state (684.2): "Cheating requires an "F" course grade and further attendance in the course is prohibited." (appeal process is also outlined, see the web site above for details.). Plagiarism, per university policies (684.4) can be treated as a form of cheating, although a level of discretion is given to the instructor, allowing the instuctor to determine the causes of plagiarism and effect other means of remedy. It is the obligation of the instructor to inform the student that a penalty is being assessed in such cases.

Course Policies

All homeworks are to be completed by each student **individually**. Lab assignments are to be completed by the appropriate units (individual, pair, group), and no code/solution-sharing between units is permitted. Students are encouraged to discuss class content among themselves but NOT in a manner that constitutes plagiarism and cheating as defined above (e.g., you can solve together a problem from the textbook that had not been assigned in the homework, but you should solve assigned problems individually).