CS 4250 Database Management Systems

Course Syllabus

Room:	P-114	Meeting Times: MWF 9:05AM – 10:03AM
Textbook:	*An Introduction to Database Systems (7th Ed.),* by C.J. Date, Addison-Wesley Publishing, 2002.	
Instructor:	Edward L. Lamie	Office: P-284
	Office Hours:	M&W 1:30-3:00PM and Tue 1:30-4:30PM
	Email address:	lamie@altair.csustan.edu
	Class website:	www.cs.csustan.edu/~lamie/cs4250/main.htm

Grading Criteria:

Exams (mid-term and final) 60%
Project..... 40%

Catalog Description

CS 4250 Database Management Systems (3 units).
Modeling, development, and implementation of database systems, using storage structures, data definition languages, and data manipulation languages for the relational approach to database management. Database integrity and security problems. Historical development of database systems. Corequisite: CS 4252. Prerequisites: CS 3050 and 3100 (Spring).

Course Overview

We will study the philosophy, design, and implementation of software systems for organizing databases. We will investigate several database models, with an emphasis on the relational approach. A sample commercial implementation of database management systems will be introduced to illustrate capabilities and limitations of these systems. These examples and the project will be run on campus computers.

Course Components

There will be two exams given during the course of the semester – a mid-term exam and a final exam. Both exams are equally weighted.	60%
A project using PHP, HTML, SQL, the MySQL database system, and the computer science Unix system will be assigned during the course. This project is worth 40% of your course grade.	40%

Project Summary

Your instructor needs help in developing a web-based grade book database system for his classes. At the beginning of each semester, your instructor will enter data about each of the courses being taught. This includes basic course information, such as the course CRN, the course title, and the semester the course is being taught, as well as student information such as student names, student user names, and passwords for each course. Each time your instructor grades an exam or homework assignment, he will update the grade book system with this information. During the semester, the students in these courses will be able to access the grade book system to retrieve their scores and relative standing in the class. Since an issue of privacy would arise in students being able to access each other's grades, you will also need to devise a method of allowing only students with the correct user name and password to access their grade-related information.

By the end of this course you will have a basic knowledge of the following noteworthy and résumé-building languages: HTML[1], PHP[2], and SQL[3]. You will also gain valuable MySQL database experience, and database design knowledge.

Project Phases

This project is divided into four phases (with firm deadlines) during the semester. There is no provision for late assignments, which will receive no credit. Following are preliminary descriptions of these four phases.

Phase I (5%) Due Monday, February 25

Get your web site up and running on the *Suns*. Log into your normal login account on the Suns and create a new directory titled `public_html` in the root of your home directory; you can do this by typing

```
mkdir public_html
```

at the command prompt.

Make sure your home and `public_html` directories have *read* and *execute* permissions for the world, and all the files in the `public_html` directory should also have *read*

[1] HTML is *Hypertext Markup Language*
[2] PHP is an acronym for *PHP: Hypertext Preprocessor*
[3] SQL is Structured Query Language; it may be pronounced as "Sequel" or ess-que-ell.

access for the world. This gets tricky though. **Before you give your home directory *read* and *execute* permissions for the world, you better make sure you take away *read* and *execute* permission for all of the other files and directories inside your home directory which contain information you don't want others to be able to access, or else anyone that has access to the *Suns* will be able to access your existing files, such as any existing code you have.** Use `chmod` to set the permissions. For example,

```
chmod go-rwx <filename>
```

will remove *read, write*, and *execute* access for the file <filename> for group and world access. To list the permissions of all of the files in a directory, use

```
ls –l
```

To add *read* and *execute* permissions for your web directory, use

```
chmod o+rx public_html
```

To add it for your home directory, use

```
chmod o+rx <your login name>
```

For more explicit instructions on permissions, talk to Julie in the lab. After you get all of your permissions set, set up a file called `index.php` in the root of your `public_html` directory. In this file, add the following line of code

```
<?php echo "Hello World" ?>
```

exactly how it is typed here, including the < and >. After you succeed, make sure the permissions of the file are set correctly by typing `ls –l` in the `/public_html` directory. If the permissions look something like this

```
-rwx------
```

then you need to type

```
chmod o+rx index.php
```

If you again type `ls –l`, the permissions should look similar to

```
-rwx---r--
```

After the permissions are correctly set up, try accessing the page via a web browser. The URL for it will be

`http://spica.csustan.edu/~<your login name>/index.php`

An example of this is

`http://spica.csustan.edu/~lamie/index.php`

After you've completed this phase, send me the URL to your page via email by the due date to receive credit.

Phase II (25%) Due Wednesday, March 20

Design and develop the database structure, define the tables to be used, and populate the tables with sample data provided on the class web site. Take screenshots of your database design and submit them via email for credit. Since we're using the *phpMyAdmin* web interface for the database, you can take screenshots showing the structure of your database. You can take a screenshot of the active window on the Windows platform by pressing the keyboard combination `<Alt><PrtScn>`. This will take a snapshot of the window with the focus and place it on the clipboard as an image. You can then open up a paint program, such as paint.exe (located under accessories in the start menu) and paste it in the paint program. From there you can save it as an image. Save it as a *JPEG* or *GIF* file if this feature is available on the version of *Paint* available on the *Windows OS* you are using. Send the images as an email attachment to me at lamie@altair.csustan.edu by the deadline to receive credit. Make sure the images clearly show your table structure as well as the populated sample data.

Phase III (35%) Due Wednesday, April 24

Design and develop a web-based instructor login system where the instructor can add, delete, or modify data in any of the tables. Upon completion, send me an email letting me know that you're finished, attach several appropriate screenshots and make sure you include the URL to your site again.

Phase IV (35%) Due Wednesday, May 22 (revised)

Design and develop a web-based student login system where students can retrieve information about their course progress, given their login names and passwords. Upon completion, send me an email letting me know that you're finished and make sure you include the URL to your site again. Also once again submit screenshots of your completed database design, and an appropriate design document describing your database design.

Resources

HTML

There are numerous tools available that can greatly simplify the HTML creation portion of this project. You are by no means expected to code the HTML for the project by hand. That would be like trying to code one of your *C/C++* projects using assembly language in CS 2500. *Microsoft FrontPage*, which is part of the *Microsoft Office Suite*, should be installed on some of the lab computers; as well *Microsoft Visual Interdev* can be installed with *Visual Studio*, and may also be on some of the lab computers. There are also numerous other HTML generation software packages available, some free, with a little bit of searching on the Internet you should be able to find one you like.

There are also numerous HTML tutorials available on the Internet to learn HTML. You will need some knowledge on how to code HTML in order to make effective use of PHP. Especially focus on the section on *tables* in HTML.

PHP

To get started learning PHP, first try the PHP tutorial at http://www.php.net/tut.php. After that, next move on to the PHP manual at http://www.php.net/manual/en/.

You can also access both of these links from the class website.

I recommend doing Phase I first before you dig into the PHP tutorial and manual so you have your web site setup and can follow along and begin playing with the syntax. It shouldn't take you longer than a few hours to pick it up, since the syntax of PHP is based on *C*, a language you are quite familiar with by now.

MySQL

Julie was kind enough to find us a MySQL web interface for the course so you won't have to do all of your work from the command prompt. The MySQL web interface can be found at http://spica.csustan.edu/phpMyAdmin and I'll be setting up accounts for it during the first week of the course.

Chapter 3 and Chapter 6 of the MySQL manual may also be quite useful to you. Chapter 3 is a MySQL tutorial, and although you'll be working with the web interface for MySQL, Chapter 3 still provides a simple overview of how to write queries. Chapter 6 is the MySQL language reference, and will be quite helpful during phase II.

You can access the MySQL manual at *http://www.mysql.com/doc/* or from the link on the class website.