CSE 5450 - Database Systems I

Winter 2018

General Information

Guest Lecturer: John Meyer
Office Location: 525 EC
Office Hours: half hour before and after class
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Date Range: Jan 4, 2018 – Apr 17, 2018
Lectures: Tuesday, Thursday 7:30 PM to 9:17 PM
Final Exam: Tuesday, April 24th, 2018, 7 – 10 PM
Classroom: HH 225

Course Information

Course Description:

Concurrency control, recovery, and query optimization for database systems; distributed database systems; object-oriented database systems; knowledge-base systems; optimization of conjunctive queries and linear recursions; experimental knowledge base systems; the universal relation as a user interface. Students will create and conduct studies of standard relational databases as a laboratory component of this course.
Prerequisite: CSE 3450, CSE 5050, CSE 5060 and CSE 5070 or equivalent (4 credits)

Course Objectives:

The goal of this course is to introduce the student to the concepts on how a Database management System (DBMS) works. Upon completion of the course, successful students will be able to:

- Describe issues related to the physical performance of database systems. (CS:[b,c,k], IT:[b,c,i,j,k])
- Describe internal storage schemes, indexing approaches, and their performance characteristics. (CS:[b,c,k], IT:[b,c,i,j,k])
- Describe issues related to the query optimization of database systems. (CS:[b,c,k], IT:[b,c,i,j,k])
- Describe issues related to transaction processing, concurrency control, and database recovery. (CS:[b,c,k], IT:[b,c,i,j,k])

- Research and present current issues in research in database and related fields. (CS:[b,d,f], IT:[b,d,f])

Required Text: Fundamentals of Database Systems, 7th edition [Hardcover], Pearson Education, ISBN-10: 0-13-397077-9, ISBN-13: 978-0-13-397077-7

Groups

Students will be expected to work in groups for this course. Group members will be chosen during the second class period. You will be allowed to pick your group subject to the following constraints:

- Maximum of one doctoral student per group.
- Undergrads will be placed in a group with a doctoral student.

Research

Each group will be assigned one of the advanced chapters in the book (e.g., Data Mining, Semi-Structured data and Web Mining, etc.). The group will be expected to develop an hour long presentation for the class on the material from the book, along with the latest research in that area. All group members are required to spend equal time presenting during each presentation. More detail on the presentation format will be provided during the course.

Summary Paper

Each group will be required to summarize the results of your research. The papers should include an introduction to the topic assigned, a summary of relevant papers you've researched, and a summary of your conclusions. The paper should summarize the material your group presented in class.

Papers should comply with the IEEE conference paper format. Templates and details on the format are at:

http://www.ieee.org/conferences_events/conferences/publishing/templates.html

More detail on the report format will be provided during the course.

Demonstrations

Starting at week 4, each group will give a half hour demonstration of a relational and/or object DB toolbox. The group will choose a toolbox, give a presentation as to its capabilities, then demonstrate the toolbox to the class. These toolboxes should help create/access databases, such as SQLite (C), ZODB (Python), etc.

Exams

Mid-Term Exam

The mid-term exam will be a take home exam, due the Tuesday following resumption of classes after Spring Break (March 6th @ midnight). You will be expected to take one of the toolboxes, in the language of your choice, and use it to analyze a data set. This is an individual, not a group exam and you are expected to do your own work.

For the exam will be you will need to document your results and submit them on moodle. It should take you about an hour to analyze the data and another hour to write up your results. Note there is no right or wrong answer for this exam. You will be graded on your ability to analyze the data set, write up your results, and justify why the results went as expected or explain what went wrong.

Final Exam

The final exam will be open book and open notes. Electronic devices will not be needed (laptops, phones, calculators, etc.), but can be used if needed. This is an individual, not a group exam and you are expected to do your own work.

Homework problems will be assigned during the semester. You are not required to do the homework problems, however, they will be representative of the questions you can expect to see on the final exam.

Class/Group Participation

In general, you are not required to attend class. All students will be expected to attend the group presentations and evaluate the other groups. You are encouraged to ask questions of the presenters.

Class attendance is a prerequisite to class participation. When you are in class you are expected to be actively engaged and ask questions. You are also expected to participate in your group. Your group paper should list the contributions each group member has made to research and the paper.

Grading

Group Presentations	
Toolbox	10%
Research	20%
Group Paper	20%
Homework	0%
Exams	
Midterm	20%
Final	20%
Class / Group Participation	10%

Academic Conduct

Students who are suspected of academic dishonesty will receive 0.0 in this course. Academic dishonesty includes, among other things, plagiarism (copying without acknowledging the source), unauthorized procurement, distribution or acceptance of examinations, or giving or receiving assistance from an unauthorized source while completing an examination or other individual assignment. Extreme cases result in expulsion from the University. You are expected to do your own work. No one may give you answers to homework or exams. You are allowed to work on project assignments with the members of your group. In other words, students are encouraged to communicate about general principles of the course, but all assigned homework must be done on an individual basis. The instructor will be available to provide any assistance that you may need. You may not exchange any code or solutions, either in pieces or in entirety, by any electronic means or hard copy. Plagiarism of any type will result in an automatic report to the University Official. You may find the "Academic Conduct Policy" as explained in the Oakland University 2010-2011 Undergraduate catalog. It may also be found on the OU website at
http://catalog.oakland.acalog.com/content.php?catoid=3&navoid=150.