CS174B Design and Implementation Techniques of Database Systems[1]

Winter 2018
Prerequisite: Computer Science 130B
Credits: 4

Catalog Course Description:
Query processing, optimizer, access methods, indexing; transactions, ACID properties, concurrency control; distributed databases; search engine; distritbuted key-value store.

Textbook: Database Management Systems, 3rd Edition, R. Ramakrishnan and J. Gehrke, McGraw-Hill, 2003
References:

1. Database System Implementation, H. Garcia-Monila, J. D. Ullman, and J. Widom, Prentice Hall, 2000
2. Database System Concepts, 6th Edition, A. Silberschatz, H. F. Korth, and S. Sudarshan, McGraw-Hill, 2010

Course Goals:
Learn the essential query optimization techniques and transaction system design techniques in database management systems; have a basic understanding of DBMS implementation; keep updated on the newest development of Databases

Prerequisites by Topic:
Data structures, algorithm design and analysis, programming in Java/C/C++, B-tree indexing.

Lectures:
Time: Tu/Thur 11:00-12:15pm
Location: CHEM 1171
Discussion Session I: Thursday 3:00- 3:50pm PHELP 3526
Discussion Session II: Thursday 4:00- 4:50pm PHELP 3526

Instructor:
Professor Xifeng Yan, Department of Computer Science
Email: xyan@cs.ucsb.edu
Office Hours: Thursday. 1:00-2:00pm or by appointment, HFH 1111

Teaching Assistant:
Yi Ding, Department of Computer Science
Email: yding@cs.ucsb.edu
Office Hours: TBD

Requirements:
1. There will be a midterm exam and a final exam (close-book, close-notebook). The midterm exam covers topics discussed in lectures and discussions before the exam; the final covers the materials

---

[1]This syllabus is adopted from Prof. Jianwen Su.

taught after the midterm.

2. There will be a course project and about 4 homework assignments.

3. Copying (parts of) answers or programs in homework, project, or an exam will automatically result in a FAILURE for the course and a report to the Department and the University.

Grading: Homework 25%, Exams 50%, Project 25%

Course Outline (tentative):

1. Introduction

2. Storage and indexing, Chapters 8-11

3. Query optimization, Chapters 12-15

4. Transaction management, Chapters 16-18

5. Key-value store