COMP9315 03s2
Database Systems Implementation
Course Introduction

Aims

This course aims to examine the data structures and algorithms that go to make up a database management system such as Oracle. An alternative title for the course could be "Database Management Systems".

At the end of this course, students should

- have some insight into how DBMSs function internally
- understand how to analyse the performance of data-intensive systems
- be familiar with a variety of programming techniques for large-scale data manipulation
- appreciate advanced transaction processing issues in database systems

The course will examine techniques from both the research literature and commercial systems.

Prerequisites

This course assumes that you have a reasonable understanding of the following topics:

- the Java language and programming in Java (e.g. completed COMP9021)
- developing applications on RDBMSs (SQL, relational algebra e.g. COMP9311 or COMP3311)
- file organisation/manipulation (Unix `open`,`close`,`lseek`,`flock` e.g. COMP9024 or COMP2011)
- sorting/searching techniques (quick/merge sorts, binary trees, hash tables e.g. COMP9024 or COMP2011)

If you do not have this prerequisite knowledge, you should reconsider your enrolment in the course.

Staff Members

Name	Office	Phone	E-mail	Role
Dr. Xuemin Lin	K17-503	6493*	lxue*	Lectuer in charge
Mr. Jialie Shen	K17-401-15	6908*	jls*	Course Admin

* Please don't call us nor mail us unless some thing is urgent. You are invited to meet us **in person** during the consultation time slots and during the lab periods.

Lectures

The course has 3 hours of lectures per week, held each Tuesday from 6-9pm at OBM112.

The following table gives the major topic areas in the syllabus and an approximate guide to how much time will be devoted to each. More fine grained syllabus details can be found on the course Web site.

Introduction	1 week
Storage Management	1 week
Indexing and Query Processing	5 weeks
Query Optimization	2 weeks
Transaction Management	4 weeks

The lecture notes for each week will be available on the course web site by Monday of that week.

Assessment

There will be 3 assignments, 2 projects, and 1 final exam. The assessment components contribute to the overall course mark as follows:

Project 1*	7%
Project 2*	8%
Assignment 1**	5%
Assignment 2**	5%
Assignment 3**	5%
Final Exam	70%

* Later penalties: 10% reduction of your marks for the 1st day, 30% reduction/day for the following days.

** Later submissions: Zero marks.

Text Books

The lecture notes for the course are more than 50% from the first textbook.

1. Ramakrishan, *Database Management Systems*, McGraw-Hill, 2000 (2nd Edition) or 2002 (3rd Edition).
2. Garcia-Molina, Jeffrey Ullman, and Widom, *Database System Implementation*, Prentice Hall, 2000.
3. Silberschatz, Korth & Sudarshan, *Database System Concepts* (3r d ed), McGraw-Hill, 1998.
4. Elmasri & Navathe, *Fundamentals of Database Systems* (3rd ed), Benjamin/Cummings, 1999.

References:

The following two papers cover much of the more advanced material in storage management and query processing:

1. Graefe, *Query Evaluation Techniques for Large Databases*, ACM Computing Surveys, 25(2), 73-170, 1993.
2. Gaede and Gunther, *Multidimensional Access Methods*, ACM Computing Surveys, 30(2), 170-231, 1998.

Both papers are available to download and print from the course web site.

Warning: there is a lot of inconsistency in notation among the textbooks and the papers. This is due to the area still being reasonably young and research-active. Keep this in mind when reading material from a variety of sources; you'll probably need to do some mental mapping from one notation/analysis-scheme to another.

More Information

For further information on this course, and to keep up to date with any changes, please consult the course web site (frequently):

http://www.cse.unsw.edu.au/~cs9315/

Xuemin Lin, 17th July 2003