COMP3311 (05s2) Course Introduction

1. Aims

This course aims to explore the practice of developing database applications, the theory behind relational database systems, and the technologies used to implement database management systems. This course will be the foundation of other database courses, such as COMP9315 (DBMS Implementation), COMP9314 (Next Generation Database Systems), COMP9318 (Data Warehousing and Data Mining), COMP9321 (E-Commerce Systems Implementation Infrastructure), etc.

By the end of the course, students should be able to:

- develop accurate, non-redundant data models
- realise data models as relational database schemas
- implement relational schemas via the Oracle DBMS
- formulate queries via the full range of SQL constructs
- effectively utilise triggers and stored procedures
- understand performance issues in relational database applications
- understand query and transaction processing techniques for RDBMSs
- appreciate the past, present and future of database technology

2. Pre-requisites

The formal pre-requisite for this course is COMP2011 Data Organisation. The knowledge that we assume from COMP2011 is: experience with procedural programming, and an understanding of a range of in-memory searching data structures (e.g. trees and hash-tables).

Some of the other material in the course (e.g. ER model and basic SQL) may also be familiar to students who have taken these courses, but don't make the mistake of thinking “I know all this stuff”; we will most likely cover these areas in more depth than you've seen them previously.

3. Web Pages

The web site will provide links to all material related to this course. The pages can be accessed via:

http://www.cse.unsw.edu.au/~cs3311/

You should become familiar with the structure and content of the course web pages early on, and consult them frequently. In particular, all important announcements will be posted to the “News” section. Urgent announcements will also be mailed to all members of the class.

4. Syllabus

The following is a summary of the topics that will be covered in this course. Topics will not be covered in the order shown here. There will be different levels of detail on the different topics (some will provide overviews, some will be more detailed).

1. Data modelling and database design
    - Entity-relationship (ER), relational models
    - Relational database design (theory of dependencies, normalisation, ...)
2. Database application development
    - SQL for querying and data definition (Oracle's version)
    - SQL for constraints and triggers (Oracle's version)
3. DBMS implementation technology
    - DBMS architecture
    - Storage and indexing, query evaluation, transaction processing

- Database performance tuning

5. Course Material

- All lecture notes, tutorial and lab notes will be posted on the course web site. These notes summarises the major contents and help you to understand the materials when you read the textbook later. You definitely need to read the corresponding chapters in the textbook to gain a full understanding of the course materials.
- [SKS02] is the textbook for this course. We got two copies on **standard loan** in the library, two on **one week loan**, and four on **two hour loan**.

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[SKS02] Database System Concepts, Silberschatz, Korth, Sudarshan
        4th edition, 2002, McGraw-Hill, ISBN: 0-07-112268-0
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- Reference books for this course are:

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[RG02]  Database Management Systems, Ramakrishnan and Gehrke
        3rd edition, 2002, McGraw-Hill, ISBN: 0-07-115110-9

[EN03]  Fundamentals of Database Systems, Elmasri and Navathe
        4th edition, 2003, Addison-Wesley, ISBN: 0-321-20448-4
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- Programming with Oracle: Several links to the oracle documents and manuals will be provided in the course homepage. We will not be able to cover them in detail and you are expected to learn by yourself. Searching the web is also a great way to find answers for beginners.

6. Classes

Day	**Time**	**Location**
Mon	2--4 PM	Red Centre Theatre
Tue	2--3 PM	BIOMED C

7. Tutorial and Labs

Tutorial and lab information will be posted on the course web page.

8. Consultation

Day	**Time**	**Location**
Tue	1500 -- 1600	K17 402 (or 424)
Fri	1500 -- 1600	K17 402 (or 424)

9. Assessment

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ass1   = mark for written assignment 1
ass2   = mark for written assignment 2
ass3   = mark for written assignment 3
proj1  = mark for programming project 1
proj2  = mark for programming project 2
exam   = mark for final exam

t      = (BEST_TWO_OF(ass1, ass2, ass3) + proj1 + proj2) / 4
grade  = (2 * exam * t) / (exam + t)
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10. Summary

By the end of this course, we want you to be capable of building high-quality (correct, efficient, and usable) applications based on relational databases, to have a sound understanding of issues in managing relational database management systems, and an overview of how they work internally.