Course Outline Student

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Course Details

- Course Code/Title : COMP9311 Database Systems
- Units of Credit : 6
- Course Website : http://www.cse.unsw.edu.au/~cs9311
- Handbook Entry : http://www.handbook.unsw.edu.au/postgraduate/cours... (http://www.handbook.unsw.edu.au/postgraduate/courses/2019/COMP9311.html)

Course Aims

This course aims to explore in depth the practice of developing database applications and the theory behind relational database management systems (RDBMSs). This course focuses on Database Design. It will also give an overview of the technologies used in implementing database management systems and the past, present and future of database systems and database research.

Large data resources are critical to the functioning of just about every significant modern computer application, and so knowledge of how to manage them is clearly important in industry. In the context ofthe further study, understanding how to use databases effectively is essential for courses such as COMP9321 Web Applications Engineering and COMP9322 Service-Oriented Architectures. COMP9311 also provides a foundation for further study in advanced database topics, such as COMP9315 Database Systems Implementation and COMP9318 Data Mining. Database concepts are also relevant in courses such as COMP9319 Web Data Compression and Search and COMP6714 Information Retrieval and Web Search

Student Learning Outcomes

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

- develop accurate, non-redundant data models
- realise data models as relational database schemas
- formulate queries via the full range of SQL constructs
- use stored procedures and triggers to extend DBMS capabilities
- understand principles and techniques for administering RDBMSs
- understand performance issues in relational database applications
- understand the overall architecture of relational DBMSs
- understand the concepts behind transactions and concurrency control
- appreciate query and transaction processing techniques within RDBMSs
- appreciate the past, present and future of database technology

Glossary:

- **DBMS** : DataBase Management System ... software system to support database manipulation
- **RDBMS** : Relational DBMS ... the most popular style of DBMS (refers to underlying data model)
- **SQL** : Structured Query Language ... the ANSI standard language for manipulating RDBMSs

Teaching Strategies

- Lectures : deliver the basic concepts and explain with detailed examples
- Lab Work : help students implement basic database components with real-life database instance

- Consultation : weekly consultation to provide personalized advice to students on their progress in the course.

Teaching Rationale

The learning focus in this course is primarily lectures (theoretical knowledge) and projects (practical knowledge). The course will have an emphasis on problem-solving for real applications.

Course Weekly Schedule

The following table summarises the planned weekly activities for the course. These are tentative. Please refer to the relevant sections of the course homepage for the most up-to-date information about weekly schedule throughout the course delivery period.

#	Lecture (Monday)	Lecture (Thursday)	Labs	Assessments
1	Subject Introduction，Conceptual DB Design (ER)	Relational Data Model	No Lab	
2	ER to Relational Model Mapping	Relational Algebra	Lab01 – setting up a database server	Assignment 1: Data Modelling and Relational Algebra
3	SQL	SQL (continue)	Lab02 – schema definition and data constraints	
4	Public Holiday No Lecture	PLpgSQL	Lab03 – SQL queries and view definitions	Assignment 1 Due Project 1: SQL
5	Functional Dependencies	Normal Forms	Lab04 – more SQL practice	
6	Relational DB Design	Disks, Files, Index	Lab05 - SQL/PLpgSQL functions	
7	Transaction Management	Transaction Management (continue)	Lab07 - database tiggers	Project 1 Due
8	Query Processing	NoSQL Data Models	Lab consultations will run	Assignment 2: DB Design Theory, Database Storage Structures and Transaction
9	Research Topics	Research Topics (continue)	Lab08 - a practice on SQLite (an alternative DB)	

10	Revision	No Lecture	Lab09 - more practice on SQLite	Assignment 2 Due

Assessments

Number	Name	Full Mark
1 *	Assignment 1: Data Modelling + Relational Algebra	25
2 *	Assignment 2: DB design Theory + Transaction	25
3 *	Project 1	50
4	Final Exam	100

Later Submission Penalties:
* : 20% reduction of your marks for each day
The final mark is calculated by the harmonic mean:
Final Mark= 2 * (ass1 + ass2 + proj1) * FinalExam / (ass1 + ass2 + proj1 + FinalExam)

Course Email

comp9311unsw@gmail.com (mailto:comp9311unsw@gmail.com)

Note: You are invited to meet us **in person** during consultation time slots and during the lab periods. For normal questions, we recommend you to use the Q&A forums. You are also welcome to contact us via course email if something is urgent.

Lectures Time

18:00 - 20:00 (Mon) week 1-3, 5-10
18:00 - 20:00 (Thu) week 1-9

Course Resources : Textbooks

Author(s)	Title	Edition	Publisher/Year
Elmasri & Navathe	Fundamentals of Database Systems	6th edition	Addison-Wesley, 2010

Course Resources : References

Author(s)	Title	Edition	Publisher/Year
Jeffery D. Ullman, Jennifer Widom	A First Course in Database Systems	Recent Edition	Prentice Hall
R. Ramakrishan	Database Management Systems	3rd	McGraw-Hill, 2003
D. Maier	The Theory of Relational Databases	1st	Computer Science Press, 1983

Academic Honesty and Plagiarism

Plagiarism is defined as "using the words or ideas of others and presenting them as your own". UNSW and CSE treat plagiarism as academic misconduct, which means that it carries penalties as severe as being excluded from further study at UNSW. There are several online sources to help you understand what plagiarism is and how it is dealt with at UNSW:

- Learning Centre: Plagiarism and Academic Integrity (https://student.unsw.edu.au/plagiarism/)
- MyUNSW: Plagiarism (https://my.unsw.edu.au/student/atoz/Plagiarism.html)
- CSE: Addendum to UNSW Plagiarism Guidelines (http://www.cse.unsw.edu.au/~teachadmin/tc/Agendas/DraftPlagiarismPolicy280705.pdf)
- CSE: Yellow Form (http://www.cse.unsw.edu.au/people/studentoffice/policies/yellowform.html) (whose terms you have agreed to)

Course Evaluation and Development

This course is evaluated each session using the CATEI system. In this session, we will use more concrete examples to demonstrate difficult concepts.

More Information

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

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