Course Outline

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 (Tuesday)	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	
7	Relational DB Design	Disks, Files, Index	Lab05 - SQL/PLpgSQL functions	Project 1 Due
8	Transaction Management	Transaction Management (continue)	Lab06 - database tiggers	Assignment 2: DB Design Theory, Database Storage Structures and Transaction
9	Advanced Topics I	Advanced Topics II	Lab07 - relational design theory	
10	Advanced Topics III	Revision	Lab08 - a practice on SQLite (an alternative DB)	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 during consultation time slots and during the lab periods if you have any questions. You may also use the Q&A forums. You are also welcome to contact us via course email or contact lecturer (wenjie.zhang@unsw.edu.au) if something is urgent.

Lectures Time

16:00 - 18:00 (Mon) week 1-3, 5, 7-10
13:00 - 15:00 (Tue) week 1-5, 7-10

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).

Resource created 10 months ago (Tuesday 01 September 2020, 03:12:55 PM), last modified 8 months ago (Monday 26 October 2020, 02:01:42 PM).

Comments

(/COMP9311/20T3/forums/search?forum_choice=resource/51065)

(/COMP9311/20T3/forums/resource/51065)



Nilan Peduru Arachchige (/users/z5131536) 9 months ago (Wed Sep 30 2020 07:10:11 GMT+1000 (Australian Eastern Standard Time))

Hi,

Can you please make sure to have the Monday lecture recording uploaded by Tuesday morning? I want to be diligent with my study and this will help me greatly.

Best regards,

Nilan Peduru



Michael Ruisi Yu (/users/z3466386) 9 months ago (Wed Sep 30 2020 13:37:09 GMT+1000 (Australian Eastern Standard Time))

Afternoon Nilan, It's nice to see students being studious.

My understanding is that, unless there's an mistake, the recordings are automatically available on the Moodle blackboard collaborate platform on the day. For example, It's 1:20pm now and I am able to see the recordings for the Lab from this morning. Thankfully, Moodle makes any recording available as soon as it is processed, usually within hours of the session.

While we normally make a copy of the link available on the course website for easy access. If there's a delay in us posting that link, I think you should be able to see the recordings anyways if you directly access through through Moodle/blackboard collaborate platform (top left there's a menu button, which lets you inspect recordings).

I'll keep an eye out for this next week, thanks for the note~
Michael



Nilan Peduru Arachchige (/users/z5131536) 9 months ago (Wed Sep 30 2020 14:48:22 GMT+1000 (Australian Eastern Standard Time))

Hi Michael,

Yes, you are correct. Lectures are available on moodle. Apologies for my mistake.

Best regards,

Nilan Peduru



Jemima Capper (/users/z5337219) 9 months ago (Tue Sep 22 2020 09:35:55 GMT+1000 (Australian Eastern Standard Time))

Hi there,

In the first lecture you mentioned that there isn't a list of Chapters for the different editions but that based on the titles of the lectures you could find the chapters in the book. You've been putting the chapter on your PPTs which has been really helpful. I have put together a table of the chapters that look most likely from the lecture headings in case it is helpful for anyone else who likes to read ahead in order to avoid duplicated effort.

I would love some feedback as to whether these look correct but I'm sure it will become evident as the lectures come out - the worst that can happen is that I do extra reading!

Thanks!

Jemima

COMP9311 – Introduction to Database Design
Readings from Fundamentals of Database Systems (Global Edition)

Week	Lecture 1	Lecture 2
1	***(Optional Introduction:*** ***Chapter 1:*** *Databases and Database Users* ***Chapter 2:*** *Database System Concepts and Architecture)*	**Chapter 3:** Data Modelling using the Entity-Relationship (ER) Model **Chapter 4:** The Enhanced Entity-Relationship (EER) Model
2	**Chapter 5:** The Relational Model and Relational Database Constraints **Chapter 9:** Relational Database Design by ER- and EER-to-Relational Mapping	**Chapter 8:** Relational Algebra and Relational Calculus
3	**Chapter 6:** Basic SQL **Chapter 7:** More SQL: Complex Queries, Triggers, Views, and Schema Modification	**Chapter 10:** Introduction to SQL Programming Techniques
4	No Lecture	*Unsure of Chapter for PL/pgSQL*
5	**Chapter 14:** Basics of Functional Dependencies and Normalization for Relational Databases	**Chapter 14** continued
6	**Flex**	
7	**Chapter 15:** Relational Database Design Algorithms and Further Dependencies	**Chapters 16:** Disk Storage, Basic File Structures, Hashing, and Modern Storage Architectures **Chapter 17:** Indexing Structures for Files and Physical Database Design
8	**Chapter 20:** Introduction to Transaction Processing Concepts and Theory **Chapter 21:** Concurrency Control Techniques	**Chapter 22:** Database Recovery Techniques
9	**Chapter 18:** Strategies for Query Processing **Chapter 19:** Query Optimization	**Chapter 24:** NOSQL Databases and Big Data Storage Systems

Wenjie Zhang (/users/z3195544) 9 months ago (Sun Sep 27 2020 16:00:42 GMT+1000 (Australian Eastern Standard Time))

Hi Jemima,

Thanks for listing the matching. Note there are different editions of the textbook and this may vary from one edition to another.

Actually based on the title of the lecture notes it is straightforward to locate the corresponding chapter in the text book. The lecture notes are self-contained and it is completely fine to rely on the lecture notes only.

Xin Qiu (/users/z5278144) 9 months ago (Mon Sep 21 2020 10:56:51 GMT+1000 (Australian Eastern Standard Time))

Hi Wenjie,

Is there a link to the consultation? I did not find it.

Thanks.

Chenji Huang (/users/z5096900) 9 months ago (Mon Sep 21 2020 11:10:48 GMT+1000 (Australian Eastern Standard Time))

Hi Xin,

We do not provide a link for the consultations and the labs. You should be able to find them when you log in to moodle: https://moodle.telt.unsw.edu.au/

They are all in the tab (lectures and recordings).

Xin Qiu (/users/z5278144) 9 months ago (Mon Sep 21 2020 11:40:48 GMT+1000 (Australian Eastern Standard Time))

Thank you.

Julian Platt-Behrens (/users/z5331603) 9 months ago (Mon Sep 21 2020 10:07:04 GMT+1000 (Australian Eastern Standard Time))

Printable Lecture Slides

Hi I am just wondering if it would be possible to get the lecture slides on a white background to make printing easier.

Thanks.

Chenji Huang (/users/z5096900) 9 months ago (Mon Sep 21 2020 10:25:39 GMT+1000 (Australian Eastern Standard Time))

Hi Julian,

As we have provided the ppt version of the lecture slides as well, I think it would be easy for you to change the background colour to white.

Julian Platt-Behrens (/users/z5331603) 9 months ago (Mon Sep 21 2020 10:40:21 GMT+1000 (Australian Eastern Standard Time))

The only versions I have available to me in https://webcms3.cse.unsw.edu.au/COMP9311/20T3/reso... (https://webcms3.cse.unsw.edu.au/COMP9311/20T3/resources/51116) are .pdf could you please direct me to the .ppt files.

Chenji Huang (/users/z5096900) 9 months ago (Mon Sep 21 2020 11:07:12 GMT+1000 (Australian Eastern Standard Time))

Sorry about that. We did not upload the ppt for the first three slides. I have uploaded them now, and you should be able to see them at: https://webcms3.cse.unsw.edu.au/COMP9311/20T3/reso... (https://webcms3.cse.unsw.edu.au/COMP9311/20T3/resources/51116)

Julian Alfonso Ponce (/users/z5292438) 9 months ago (Tue Sep 15 2020 19:54:51 GMT+1000 (Australian Eastern Standard Time))

Is there any hurdle for final exam? Say we performed well with assignments and project but we still need to attain at least some x percent in the final exam to pass? Just wanna make sure early on.

Cheers

Chenji Huang (/users/z5096900) 9 months ago (Tue Sep 15 2020 21:05:55 GMT+1000 (Australian Eastern Standard Time))

We do not set any hard hurdle for the final exam. However, based on the final mark calculation, you will need to get at least 34 to pass this course even if you get full marks in the assignments and projects.

Patrick Li (/users/z5305975) 9 months ago (Mon Sep 14 2020 19:01:41 GMT+1000 (Australian Eastern Standard Time))

Downloadable lecture recordings - Could you please make the recordings of lecture downloadable from Bb Collaborate? Sometimes streaming would be a bit slow for students currently overseas.

Wenjie Zhang (/users/z3195544) 9 months ago (Tue Sep 15 2020 08:59:40 GMT+1000 (Australian Eastern Standard Time))

Sure, will do.

John Brehaut (/users/z5332852) 9 months ago (Sun Sep 20 2020 16:12:30 GMT+1000 (Australian Eastern Standard Time))

Hi Wenjie,

Is there an update on this?

Hoping to download the week 1 lectures so I can watch at an increased play speed.



Wenjie Zhang (/users/z3195544) 9 months ago (Sun Sep 20 2020 16:37:02 GMT+1000 (Australian Eastern Standard Time))

Hi John,

Video download has been enabled. You need to log in via Moodle using a computer (not using mobile devices) to download.

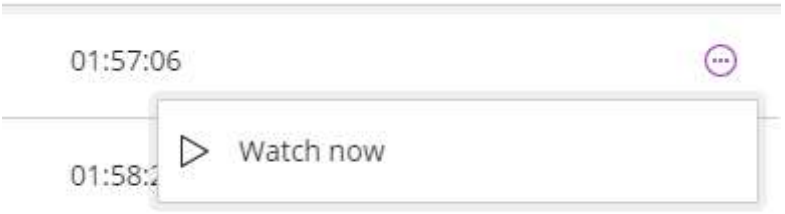


John Brehaut (/users/z5332852) 9 months ago (Sun Sep 20 2020 16:50:01 GMT+1000 (Australian Eastern Standard Time)), last modified 9 months ago (Sun Sep 20 2020 16:51:23 GMT+1000 (Australian Eastern Standard Time))

Thanks for the quick reply Wenjie.

I've tried on both my PC and Macbook, no luck.

When in BB i only see the following:



When I click on a specific recording and go to the options menu i see the following (i believe this is where it should be downloadable based on Patrick's link below):



Downloading chat just downloads a .txt file with the log of messages during the session.



Wenjie Zhang (/users/z3195544) 9 months ago (Sun Sep 20 2020 18:09:58 GMT+1000 (Australian Eastern Standard Time))

Can you try again now ?



John Brehaut (/users/z5332852) 9 months ago (Sun Sep 20 2020 18:55:46 GMT+1000 (Australian Eastern Standard Time))

Works perfectly now, thanks Wenjie!



Patrick Li (/users/z5305975) 9 months ago (Tue Sep 15 2020 15:38:06 GMT+1000 (Australian Eastern Standard Time))

I think it needs to turn on the downloadable option, if this link helps: https://help.blackboard.com/Collaborate/Ultra/Participant/Recordings#download-recordings-and-transcripts_OTP-3 (https://help.blackboard.com/Collaborate/Ultra/Participant/Recordings#download-recordings-and-transcripts_OTP-3)



Wenjie Zhang (/users/z3195544) 9 months ago (Sun Sep 20 2020 19:16:51 GMT+1000 (Australian Eastern Standard Time))

Should work now.



Qinjian Zheng (/users/z5325742) 9 months ago (Mon Sep 14 2020 18:05:07 GMT+1000 (Australian Eastern Standard Time))

Suggestion: Can the professor set up a blackboard to write or draw during the online lecture? Maybe to help us understand the material better.



Wenjie Zhang (/users/z3195544) 9 months ago (Tue Sep 15 2020 08:58:39 GMT+1000 (Australian Eastern Standard Time))

Thanks for the suggestion. We used animation in slides for the places where require a step-by-step explanation.



Rajeshwar Reddy Angiti (/users/z5195273) 9 months ago (Sat Sep 12 2020 09:05:51 GMT+1000 (Australian Eastern Standard Time))

Final Mark= 2 * (ass1 + ass2 + proj1) * FinalExam / (ass1 + ass2 + proj1 + FinalExam)
Is this supposed to be

Final Mark= (2 * (ass1 + ass2 + proj1) **) +** FinalExam / (ass1 + ass2 + proj1 + FinalExam) ?



Zeyang Zhang (/users/z5273456) 9 months ago (Mon Sep 14 2020 01:18:21 GMT+1000 (Australian Eastern Standard Time))

I'm afraid not. Let's assume one scores full mark in all sections. In that case, his final mark should be:

2*(25+25+50)*100/(25+25+50+100)=100

Use your equation, his final mark should be:

(2*(25+25+50))+100/(25+25+50+100)=200.5

which is unfortunatly incorrect