

COMP1140: Database and Information Management

Callaghan and Ourimbah

Semester 2 - 2018



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

OVERVIEW

Course Description	This course provides students with theoretical knowledge and practical skills in the use of databases and database management systems. The conceptual and logical design and implementation of relational databases are covered.
Requisites	This course has similarities to INFT2040. If you have completed INFT2040 you cannot enrol in this course.
Assumed Knowledge	SENG1110 or INFT1004
Contact Hours	Computer Lab Face to Face On Campus 2 hour(s) per Week for Full Term Lecture Face to Face On Campus 2 hour(s) per Week for Full Term
Unit Weighting Workload	10 Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

COURSE OUTLINE

CONTACTS

Course Coordinator **Callaghan and Ourimbah**
A/Prof Suhuai Luo
Suhuai.Luo@newcastle.edu.au
(02) 4985 4508
Consultation: Tuesday 12pm-1pm by appointment

Teaching Staff Other teaching staff will be advised on the course Blackboard site.

School Office **School of Electrical Engineering and Computing**
ICT307
ICT Building
Callaghan
+61 2 4921 5330
9.00am-1.00pm and 2.00pm-5.00pm (Monday to Friday)
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SYLLABUS

Course Content 1. Conceptual Modelling with ER
2. Relational Model and ER to Relational Mapping
3. Schema Refinement with Normalization based on Functional Dependencies
4. Relational Algebra
5. SQL
6. Database Transactions and Concurrency Control
7. Security, Authorisation and Access

Course Learning Outcomes **On successful completion of this course, students will be able to:**
1. Design conceptual models encapsulating data requirements for business and organisational scenarios

2. Convert conceptual models to logical data models

3. Implement a database solution using contemporary database management systems (DBMS)

4. Develop expertise in database languages (e.g. SQL) including the ability to develop sophisticated queries to extract information from large datasets

5. Understand data security and data quality management

Course Materials **Required Text:**
- **Lecture Materials:**
Please check the course Blackboard site.
Required Text:
Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to Design, Implementation & Management, Addison Wesley, 6th Edition (Global), 2015, ISBN-10 1292061189, ISBN-13 97812920611840020

COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

Contact Hour Requirements:

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Course Assessment Requirements:

- Assessment 5 - Formal Examination: Minimum Grade / Mark Requirement - Students must obtain a specified minimum grade / mark in this assessment item to pass the course. Students whose overall mark in the course is 50% or more, but who score less than 40% in the compulsory item and thus fail to demonstrate the required proficiency, will be awarded a Criterion Fail grade, which will show as FF on their formal transcript. However, students in this position who have scored at least 25% in the compulsory item will be allowed to undertake a supplementary 'capped' assessment in which they can score at most 50% of the possible mark for that item.

Pre-Placement Requirements:

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SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	30 Jul	Introduction to Course, DBMSs	Get familiar with course structure and requirements	
2	6 Aug	Assignment Requirements, Tools for DBMS	Learn and practice first step of database system design; practice on T-SQL and SQL Server	
3	13 Aug	Conceptual DB Design, Assignment specs	Learn and practice second step of database system design; work on assignment 1	
4	20 Aug	Logical DB Design, EER/ Relational Mapping	Learn and practice third step of database system design; work on EER	Assignment 1 due
5	27 Aug	Normalisation	Practice on relation normalisation; complete assignment 1	
6	3 Sep	Relational Algebra	Study the foundation of SQL programming	
7	10 Sep	SQL (DDL + DML) with Data Management	Practice on T-SQL	
8	17 Sep	Advanced SQL	Continue practice on T-SQL	Assignment 2 due
Mid Semester Break				
Mid Semester Break				
9	8 Oct	SQL Review and Test	Summary and test on SQL skill	SQL test
10	15 Oct	Views, Transactions and Triggers	Study and practice several key techniques of database system	
11	22 Oct	Physical DB Design: Files, Indexes and Query Plans; Data Access: Users, Roles, Privileges	Learn and practice last step of database system design; Learn and practice other important aspects of system maintenance	
12	29 Oct	Interface to Database; Course Summary	Practice on connecting applications to DB; course summary; assignment 3 assessment	Assignment 3 due
13	5 Nov	Review Week	No lecture, no lab	
Semester 2 Examinations				
Semester 2 Examinations				
Semester 2 Examinations				

ASSESSMENTS

This course has 5 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Assignment 1 Database Project - Description and EER model	Week 4 (Date and time advised on Assessment requirements Document)	Individual	15%	1
2	Assignment 2, Database Project - Logical Database Design	Week 8 (Date and time advised on Assessment requirements Document)	Individual	10%	2
3	Practical Test - Lab test on SQL	Week 9 (Date and time advised on Assessment requirements Document)	Individual	10%	4
4	Assignment 3 - Database Project - Physical Database Design	Week 12 (Date and time advised on Assessment requirements Document)	Individual	15%	3, 5
5	Final Examination*	In semester exam period.	Individual	50%	1, 2, 3, 4, 5

* This assessment has a compulsory requirement.

Late Submissions The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Assignment 1 Database Project - Description and EER model

Assessment Type Project
Description The stage of conceptual database design will be completed.
Weighting 15%
Due Date As advised on Assessment requirements Document
Submission Method As advised on Assessment requirements Document
Assessment Criteria As advised on Assessment requirements Document
Return Method As advised on Assessment requirements Document
Feedback Provided Yes

Assessment 2 - Assignment 2, Database Project - Logical Database Design

Assessment Type Project
Description The stage of logical database design will be completed.
Weighting 10%
Due Date As advised on Assessment requirements Document
Submission Method As advised on Assessment requirements Document
Assessment Criteria As advised on Assessment requirements Document
Return Method As advised on Assessment requirements Document
Feedback Provided Yes

Assessment 3 - Practical Test - Lab test on SQL

Assessment Type Quiz
Description Lab test on SQL
Weighting 10%
Due Date Week 9, in lab.
Submission Method Online
Assessment Criteria
Return Method Not Returned
Feedback Provided Yes

Assessment 4 - Assignment 3 - Database Project - Physical Database Design

Assessment Type	Project
Description	The stage of physical database design will be completed.
Weighting	15%
Due Date	As advised on Assessment requirements Document
Submission Method	As advised on Assessment requirements Document
Assessment Criteria	As advised on Assessment requirements Document
Return Method	As advised on Assessment requirements Document
Feedback Provided	Yes

Assessment 5 - Final Examination

Assessment Type	Formal Examination
Description	Final formal exam.
Weighting	50%
Compulsory Requirements	Minimum Grade / Mark Requirement - Students must obtain a specified minimum grade / mark in this assessment item to pass the course.
Due Date	In semester exam period.
Submission Method	Formal Exam
Assessment Criteria	
Return Method	
Feedback Provided	No
Opportunity to Reattempt	Students WILL be given the opportunity to reattempt this assessment. Refer to course outline for details.

In 2018, the University of Newcastle will undergo its 5 yearly accreditation cycle with Engineers Australia and the Australian Computer Society. Part of this routine process is the collection of a sample of student assignments over a 1+ year period. The objective is to provide the accrediting panel an indication of educational rigour across all courses. In 2017, we will commence collecting sample assignments from each and every assessment task, across the full spectrum of marks. They will be provided to the panel but not de-identified. If you object to your assignment being retained with your name associated, please indicate this on the submission, and if retained, we will de-identify your paper. All papers will be destroyed at the completion of the accreditation process.

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

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Communication Methods

Communication methods used in this course include:

- Blackboard Course Site: Students will receive communications via the posting of content or announcements on the Blackboard course site.
- Email: Students will receive communications via their student email account.
- Face to Face: Communication will be provided via face to face meetings or supervision

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to <https://policies.newcastle.edu.au/document/view-current.php?id=35>.

Adverse Circumstances

You are entitled to apply for special consideration because adverse circumstances have had an impact on your performance in an assessment item. This includes applying for an extension of time to complete an assessment item. Prior to applying you must refer to the Adverse Circumstances Affecting Assessment Items Procedure, available at <https://policies.newcastle.edu.au/document/view-current.php?id=236>. All applications for Adverse Circumstances must be lodged via the online Adverse Circumstances system, along with supporting documentation.

Important Policy Information

The 'HELP for Students' tab in UoNline contains important information that all students should be familiar with, including various systems, policies and procedures.

	University of Newcastle Computer Science Graduate Profile Statements	Taught	Practised	Assessed	Level of Capability
1	Knowledge of basic science and computer science fundamentals.	x	x	x	1
2	In depth technical competence in the discipline of computer science	x	x	x	1
3	An ability to carry out problem analysis, requirements capture, problem formulation and integrated software development for the solution of a problem.	x	x	x	1
4	Capacity to continue developing relevant knowledge, skills and expertise in computer science throughout their careers.	x	x	x	1
5	An ability to communicate effectively with other Computer Scientists, Software Engineers, other professional disciplines, managers and the community generally.				
6	Ability to undertake and co-ordinate large computer science projects and to identify problems, their formulation and solution.	x	x	x	1

7	Ability to function effectively as an individual, a team member in multidisciplinary and multicultural teams and as leader/manager with capacity to assist and encourage those under their direction.				
8	Understanding of social, cultural, global and business opportunities of the professional computer scientist; understanding the need for and principles of sustainability and adaptability	x	x		1
9	Understanding of professional and ethical responsibilities and a commitment to them.	x	x	x	1
10	Understanding of entrepreneurship; need of and process of innovation, as well as the need of and capacity for lifelong learning.	x	x	x	1

This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.

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