

COMP1140: Database and Information Management

Callaghan

Semester 2 - 2017



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**
Dr Suhuai Luo
Suhuai.Luo@newcastle.edu.au
(02) 4985 4508
Consultation: Tuesday 2pm-3pm 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)

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 must obtain 40% in the final exam to pass the course.

Pre-Placement Requirements:

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SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	24 Jul	Introduction to Course, DBMSs	Get familiar with course structure and requirements	
2	31 Jul	Assignment Requirements, Tools for DBMS	Learn and practice first step of database system design; practice on T-SQL and SQL Server	
3	7 Aug	Conceptual DB Design, Assignment specs	Learn and practice second step of database system design; work on assignment 1	
4	14 Aug	Logical DB Design, EER/ Relational Mapping	Learn and practice third step of database system design; work on EER	
5	21 Aug	Normalisation	Practice on relation normalisation; complete assignment 1	Assignment 1 due
6	28 Aug	Relational Algebra	Study the foundation of SQL programming	
7	4 Sep	SQL (DDL + DML) with Data Management	Practice on T-SQL	
8	11 Sep	Advanced SQL	Continue practice on T-SQL	Assignment 2 due
Mid Semester Break				
Mid Semester Break				
9	2 Oct	SQL Review and Test	Summary and test on SQL skill	SQL test
10	9 Oct	Views, Transactions and Triggers	Study and practice several key techniques of database system	
11	16 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	23 Oct	Interface to Database; Course Summary	Practice on connecting applications to DB; course summary; assignment 3 assessment	Assignment 3 due
13	30 Oct	Review Week	No lecture, no lab	
Semester 2 Examinations Week 1				

Semester 2 Examinations Week 2
Semester 2 Examinations Week 3

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	10am, Tuesday, August 22, 2017	Individual	10%	1
2	Assignment 2, Database Project - Logical Database Design	10am, Tuesday, September 12, 2017	Individual	10%	2
3	Practical Test - Lab test on SQL	Week 9, in lab.	Individual	15%	4
4	Assignment 3 - Database Project - Physical Database Design	Week 12, in lab.	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
Purpose	Work on first stage of database design.
Description	The stage of conceptual database design will be completed.
Weighting	10%
Due Date	10am, Tuesday, August 22, 2017
Submission Method	In Class Online
Assessment Criteria	
Return Method	In Class
Feedback Provided	Returned Work - .

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

Assessment Type	Project
Purpose	Work on second and third stages of database design.
Description	The stage of logical database design will be completed.
Weighting	10%
Due Date	10am, Tuesday, September 12, 2017
Submission Method	In Class Online
Assessment Criteria	
Return Method	In Class
Feedback Provided	Returned Work - .

Assessment 3 - Practical Test - Lab test on SQL

Assessment Type	Quiz
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Purpose	Test on SQL
Description	Lab test on SQL
Weighting	15%
Due Date	Week 9, in lab.
Submission Method	Online
Assessment Criteria	
Return Method	Not Returned
Feedback Provided	In Class - .

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

Assessment Type	Project
Purpose	Work on last stage of database design.
Description	The stage of physical database design will be completed.
Weighting	15%
Due Date	Week 12, in lab.
Submission Method	In Class Online
Assessment Criteria	
Return Method	School Office
Feedback Provided	Returned Work - .

Assessment 5 - Final Examination

Assessment Type	Formal Examination
Purpose	Course exam.
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 Feedback - .
Opportunity to Reattempt	Students WILL be given the opportunity to reattempt this assessment. n/a

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	Failure to satisfactorily achieve learning outcomes. If all

	(FF)	compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.
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*Skills are those identified for the purposes of assessment task(s).

**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 <http://www.newcastle.edu.au/policy/000608.html>.

**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 <http://www.newcastle.edu.au/policy/000940.html>. 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.

Other Information

2017 - Retention of Assignment Scripts.
In 2018, the University of Newcastle will undergo its 5 yearly accreditation cycle with Engineers Australia. 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.

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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	University of Newcastle Bachelor of Engineering Graduate Profile Statements	Taught	Practised	Assessed	Level of capability
	Knowledge Base				
1	1.1. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.				
2	1.2. Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.				
3	1.3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.	✓	✓	✓	1
4	1.4. Discernment of knowledge development and research directions within the engineering discipline.				
5	1.5. Knowledge of contextual factors impacting the engineering discipline.				
6	1.6. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.				
	Engineering Ability				
7	2.1. Application of established engineering methods to complex engineering problem solving.	✓	✓	✓	1
8	2.2. Fluent application of engineering techniques, tools and resources.	✓	✓	✓	1
9	2.3. Application of systematic engineering synthesis and design processes.	✓	✓	✓	1
10	2.4. Application of systematic approaches to the conduct and management of engineering projects.				
	Professional Attributes				
11	3.1. Ethical conduct and professional accountability	✓	✓	✓	1
12	3.2. Effective oral and written communication in professional and lay domains.	✓	✓	✓	1
13	3.3. Creative, innovative and pro-active demeanour.				
14	3.4. Professional use and management of information.				
15	3.5. Orderly management of self, and professional conduct.				
16	3.6. Effective team membership and team leadership.				

	University of Newcastle Computer Science Graduate Profile Statements	Taught	Practised	Assessed	Level of Capability
1	Knowledge of basic science and computer science fundamentals.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1
2	In depth technical competence in the discipline of computer science	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1
3	An ability to carry out problem analysis, requirements capture, problem formulation and integrated software development for the solution of a problem.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1
4	Capacity to continue developing relevant knowledge, skills and expertise in computer science throughout their careers.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	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.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	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	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		1
9	Understanding of professional and ethical responsibilities and a commitment to them.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1
10	Understanding of entrepreneurship; need of and process of innovation, as well as the need of and capacity for lifelong learning.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1