



ISYS224

Database Systems

S2 Day 2017

Dept of Computing

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General Information

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Credit points

3

Prerequisites

ISYS114

Corequisites

Co-badged status

Unit description

This unit provides an in-depth study of modern database technology and its dominant role in developing and maintaining enterprise information systems. The aim is to teach students how to program database applications. The emphasis is placed on business applications, using Structured Query Language (SQL) as an interactive and a programmatic language, on principles of the relational-database model, and on fundamental components of a client-server database-management system. Practical work involves the use of a commercial database-management system together with programming tools.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

Demonstrate understanding of the basic concepts that underlie modern database management systems.

Design and develop small, functional database applications using modern database design methods.

Develop skills in using a industrial-strength database tools and interactive development environments for building databases.

Complete different database programming tasks to specification using SQL .

General Assessment Information

Assessment Tasks Submission/Completion Process

The assessments of this unit consist of two online tests, two assignments and a final exam. You will complete the two tests on iLearn. The solutions to the two assignments should be submitted via iLearn by the due date. The final examination is a closed book examination, and will be taken in person on the appropriate date. Note that students who are approved to sit a **Supplementary Exam** will be required to take it in the week of **December 11 – 15**.

Late Submission Policy

Late assignments (**not** tests) will be accepted up to 48 hours after the submission deadline. There will be a deduction of 20% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late (for example, 25 hours late in submission – 40% penalty). This penalty does not apply for cases in which an application for special consideration is made and approved. In such cases a compensating mechanism will be decided on a case by case basis.

Assessment Standards

ISYS224 will be assessed and graded according to the University assessment and grading policies.

The following general standards of achievement will be used to assess each of the assessment tasks with respect to the letter grades.

Pass: Can demonstrate a broad knowledge of database concepts but with limited understanding. Can design and develop functional database with documentation. Is familiar with tools and interactive development environments, and comfortable with database programming.

Credit/Distinction: As for Pass plus: Exhibits breadth and depth of understanding of concepts. Can demonstrate critical analysis skills in fundamental database concepts. Able to design and develop functional and highly maintainable database, with documentation. Very familiar with tools and interactive development environments with good ability to solve database problems. Very familiar with database programming and quite able to implement solutions to database problems.

High Distinction: As for Credit/Distinction plus: Is aware of the context in which the concepts are developed and their limitations. Has demonstrated critical analysis skills in fundamental database concepts who also has exceptional analytical and critical thinking capability. Able to design and develop functional and highly maintainable database, with documentation and familiarity with tools and interactive development environments, and has exceptional ability to solve challenging database problems. Very familiar with tools and interactive development environments, and has exceptional ability to solve challenging database problems. Has exceptional database programming skills and able to implement maintainable solutions to challenging database problems.

Assessment Process

These assessment standards will be used to give a numeric mark to each assessment submission during marking. The mark will correspond to an appropriate letter grade when relevantly weighted. The final mark for the unit will be calculated by combining the marks for all assessment tasks according to the percentage weightings shown in the assessment summary.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Test 1</u>	5%	No	Week 4
<u>Assignment 1</u>	20%	No	Week 7
<u>Test 2</u>	5%	No	Week 10
<u>Assignment 2</u>	20%	No	Week 12
<u>Final Examination</u>	50%	No	TBA

Test 1

Due: **Week 4**

Weighting: **5%**

The focus of this test will be on database modeling.

On successful completion you will be able to:

- Demonstrate understanding of the basic concepts that underlie modern database management systems.

Assignment 1

Due: **Week 7**

Weighting: **20%**

Assignment 1 will focus on logical design and implementation of databases

On successful completion you will be able to:

- Demonstrate understanding of the basic concepts that underlie modern database management systems.
- Design and develop small, functional database applications using modern database design methods.
- Develop skills in using a industrial-strength database tools and interactive development environments for building databases.
- Complete different database programming tasks to specification using SQL .

Test 2

Due: **Week 10**

Weighting: **5%**

The focus of this test will be on database programming.

On successful completion you will be able to:

- Demonstrate understanding of the basic concepts that underlie modern database management systems.
- Complete different database programming tasks to specification using SQL .

Assignment 2

Due: **Week 12**

Weighting: **20%**

Assignment 2 will assess certain fundamental aspects of database systems including database programming..

On successful completion you will be able to:

- Demonstrate understanding of the basic concepts that underlie modern database management systems.
- Design and develop small, functional database applications using modern database design methods.
- Develop skills in using a industrial-strength database tools and interactive development environments for building databases.
- Complete different database programming tasks to specification using SQL .

Final Examination

Due: **TBA**

Weighting: **50%**

The final examination will assess students' understanding of the fundamental concepts behind database management systems, and their skills in database programming and development.

On successful completion you will be able to:

- Demonstrate understanding of the basic concepts that underlie modern database management systems.
- Design and develop small, functional database applications using modern database design methods.
- Complete different database programming tasks to specification using SQL .

Delivery and Resources

Classes

Each week you should attend three hours of lectures, a tutorial class and a practical session. For details of days, times and rooms consult the timetables webpage. Students are urged to actively participate in the tutorials; this helps enhancing the understanding by students.

Note that practicals and tutorials commence in week 2. You should have selected a practical session and a tutorial session during enrolment. You should attend the sessions you are enrolled in.

Required and Recommended Texts and/or Materials

Textbook

The textbook listed below cover much of the required material that will be used in preparation of lectures and/or assignments and/or practicals.

- Thomas Connolly and Carolyn Begg. *Database Systems. A Practical Approach to Design, Implementation, and Management*, Sixth Edition, Pearson, 2015, ISBN-13: 978-1-292-06118-4

For some parts of learning, other necessary material will be made available on the ISYS224 iLearn site.

Unit Webpage and Technology Used and Required

Digital recordings of lectures are available from **echo360** at iLearn. Read these [instructions](#) for details.

Websites

The web page for this unit can be found at <http://ilearn.mq.edu.au>

Technology

In this unit you will be exposed to the following technology and tools

- MySQL - Database Management System
- MySQL Workbench - Data Modeling Software Tool

Discussion Boards

The unit will make use of discussion boards hosted within iLearn. Please post questions there, they will be monitored by the staff on the unit regularly.

Unit Schedule

1	Introduction to Databases: Relational model	Connolly & Begg, Chapters 1,2,4 + Class Notes
2	Database modeling (ER modeling, EER modeling)	Connolly & Begg, Chapters 12-13
3	Conceptual & Logical Database design	Connolly & Begg, Chapters 16-17
4-6	Data Manipulation and Database Normalisation	Connolly & Begg, Chapters 6, 14-15
7	Relational Algebra	Connolly & Begg, Chapter 5

Recess		
8-9	Database Programming	Connolly & Begg, Chapter 8
10	Transaction management	Connolly & Begg, Chapter 22
11	Concurrency control, Recovery	Connolly & Begg, Chapter 22 (and Lecturer provided)
12	Data Storage and Management	(Lecturer Provided)
13	Revision	Lecturer Provided

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.m](#)

mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Assessment tasks

- Assignment 2
- Final Examination

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to

demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- Demonstrate understanding of the basic concepts that underlie modern database management systems.
- Design and develop small, functional database applications using modern database design methods.
- Develop skills in using a industrial-strength database tools and interactive development environments for building databases.
- Complete different database programming tasks to specification using SQL .

Assessment tasks

- Assignment 1
- Assignment 2
- Final Examination

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Assessment tasks

- Assignment 2
- Final Examination

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Demonstrate understanding of the basic concepts that underlie modern database management systems.
- Design and develop small, functional database applications using modern database design methods.
- Develop skills in using a industrial-strength database tools and interactive development environments for building databases.
- Complete different database programming tasks to specification using SQL .

Assessment tasks

- Test 1
- Assignment 1
- Test 2
- Assignment 2
- Final Examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Demonstrate understanding of the basic concepts that underlie modern database management systems.
- Design and develop small, functional database applications using modern database design methods.

Assessment tasks

- Test 1
- Assignment 1
- Test 2
- Assignment 2
- Final Examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Demonstrate understanding of the basic concepts that underlie modern database management systems.
- Design and develop small, functional database applications using modern database design methods.
- Complete different database programming tasks to specification using SQL .

Assessment tasks

- Test 1
- Assignment 1
- Test 2
- Assignment 2
- Final Examination

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Demonstrate understanding of the basic concepts that underlie modern database management systems.
- Design and develop small, functional database applications using modern database design methods.

Assessment tasks

- Assignment 1
- Assignment 2

- Final Examination

Changes from Previous Offering

In earlier offerings of ISYS224, Oracle was used as the Database Management Systems, and PowerDesigner as the modelling tool. In this offering MySQL and MySQL Workbench will be used in response to changing circumstances. The diagnostic test (10% in 2016) has been replaced by two online tests distributed across the two halves of the semester.