ISYS224

Database Systems

S2 Day 2019

Dept of Computing

Contents

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Credit points
3

Prerequisites
ISYS114

Corequisites

Co-badged status
Co-badged with ITEC624.

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 one in-class mid-term test, two assignments and a final exam. The solutions to the two assignments should be submitted via iLearn by the due date. The mid-term test is a closed book examination, and will be taken in person on the appropriate date and time in class in Week 9. The final examination is also a closed book examination, and will be taken in person on the appropriate date and time to be announced later in the semester.

Late Submission Policy

No extensions on assignments will be granted without an approved application for Special Consideration. There will be a deduction of 10% 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 for an assignment worth 10 marks – 20% penalty or 2 marks deducted from the total. No submission will be accepted after solutions have been posted.

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.

Supplementary Exam

If you receive Special Consideration for the final exam, a supplementary exam will be scheduled after the normal exam period, following the release of marks. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

If you receive Special Consideration for the mid-term test, you may be offered an aggregated/average mark in line with the special consideration policy. Please ensure you are familiar with the policy prior to submitting an application.

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignment 1	25%	No	Week 7
Mid-term Test	10%	No	Week 9 (Thursday)
Assignment 2	15%	No	Week 11
Final Examination	50%	No	TBA

Assignment 1

Due: **Week 7**
Weighting: **25%**

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 .

Mid-term Test

Due: **Week 9 (Thursday)**
Weighting: **10%**

The focus of this test will be on database modeling and 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 11**
Weighting: **15%**

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 at https://timetables.mq.edu.au/2019/. 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, 2014, ISBN-9781-2920-6183-2

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 (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy

- Academic Integrity Policy

- Academic Progression Policy

- Assessment Policy

- Fitness to Practice Procedure

- Grade Appeal Policy

- Complaint Management Procedure for Students and Members of the Public

- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Undergraduate students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) 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.mq.edu.au or if you are a Global MBA student contact globalmba.support@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

If you are a Global MBA student contact globalmba.support@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:

Learning outcome

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

Assessment tasks

- Assignment 1
- 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 1
- Assignment 2

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

- Assignment 1
- Mid-term Test
- 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.
- Develop skills in using a industrial-strength database tools and interactive development environments for building databases.

Assessment tasks

- Assignment 1
- Mid-term Test
- 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.
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Assessment tasks

- Assignment 1
- Mid-term Test
- 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

Prof. Mehmet Orgun joins the unit this semester, teaching in the first half. In 2018 there were two

in-class tests. This time, they will be replaced one in-class test instead. The content and structure of the unit remains the same.