



ISYS114

Introduction to Systems Design and Data Management

S2 Evening 2013

Computing

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General Information

Unit convenor and teaching staff

Unit Convenor

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By appointment

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30 minutes prior to lectures

Credit points

3

Prerequisites

Corequisites

Co-badged status

Unit description

This unit introduces students to requirements engineering/systems analysis and design, as well as databases. The principles and concepts of data storage, management and modelling are considered, including the role of data in business. The systems analysis and design component uses the traditional structured systems analysis and design method (SSADM), and acts as a design precursor to the database section of the unit. Different methodologies for database design and implementation are covered. These include the flatfile, hierarchical, network and relational approaches. Fundamental data modelling tools, techniques and query languages such as Structured Query Language (SQL) are introduced. The importance of an ethical approach to the collection, use and storage of data and the construction of systems is emphasised. The unit concentrates upon building a firm foundation in information representation, organisation and storage with particular emphasis upon the application of database systems.

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:

- Analyse system requirements and design and develop system models.
- Implement system models into databases, design and create simple databases for business information systems and write programs to produce interactive queries.
- Explain the role and nature of ethics and sustainability in the IT environment.
- Use data analysis and data modelling techniques and tools for introductory level database design and requirements specification.

Assessment Tasks

Name	Weighting	Due
Assignment 1	20%	in week 7
Assignment 2	20%	in week 11
Tutorial Submission	10%	By Monday 9am every week
Final Exam	50%	See Exam Timetable

Assignment 1

Due: **in week 7**

Weighting: **20%**

Entity Relationship Diagrams

On successful completion you will be able to:

- Analyse system requirements and design and develop system models.
- Use data analysis and data modelling techniques and tools for introductory level database design and requirements specification.

Assignment 2

Due: **in week 11**

Weighting: **20%**

Database Design

On successful completion you will be able to:

- Implement system models into databases, design and create simple databases for business information systems and write programs to produce interactive queries.

Tutorial Submission

Due: **By Monday 9am every week**

Weighting: **10%**

Tutorial Submission and Attendance

On successful completion you will be able to:

- Analyse system requirements and design and develop system models.
- Implement system models into databases, design and create simple databases for business information systems and write programs to produce interactive queries.
- Explain the role and nature of ethics and sustainability in the IT environment.
- Use data analysis and data modelling techniques and tools for introductory level database design and requirements specification.

Final Exam

Due: **See Exam Timetable**

Weighting: **50%**

Final Exam

On successful completion you will be able to:

- Analyse system requirements and design and develop system models.
- Implement system models into databases, design and create simple databases for business information systems and write programs to produce interactive queries.
- Explain the role and nature of ethics and sustainability in the IT environment.
- Use data analysis and data modelling techniques and tools for introductory level database design and requirements specification.

Delivery and Resources

ISYS114 is taught via lectures, tutorials and practicals. The feedback that you receive plays also a crucial role in your learning.

Lectures are used to introduce new material, provide motivation and context for your study, guide you in what is important to learn and explain more difficult concepts.

Tutorials and practicals are small group classes which give you the opportunity to interact with

your peers and with a tutor who has a sound knowledge of the subject. This also gives you a chance to practice your technology skills.

You have many opportunities to seek for and to receive feedback. During lectures, you are encouraged to ask the lecturer questions to clarify anything you might not be sure of. Each week, you will be given activities and problems to solve in the tutorials and practicals. This will at times involved contributing to a group of students and presenting solutions to the class. The comments and the solutions provided will help you to understand the material in the unit, prepare you for the work in assignments as well as for the final exam. It is important that you keep up with these problems every week. Assignments have been especially designed to deliver continuous feedback on your work.

Each week you should:

- Attend lectures, take notes, ask questions
- Attend your tutorial/practical and seek feedback from your tutor on your work
- Read assigned reading material (ideally before the lecture), add to your notes and prepare questions for your lecturer or tutor
- Start working on any assignments immediately after they have been released.

Lecture notes are made available each week but these notes are intended as an outline of the lecture only and are not a substitute for your own notes or reading of the textbook or other additional material.

Classes

Lectures

There are 2 hours of lectures per week.

1. Day Lectures : Tuesday 2-4 pm in W5A/230 Price Theatre.
2. Evening Lectures: Thursday 6-8 pm in W5A T1.

Each week you should attend two hours of lectures, and a 1 hour Workshop (including a tutorial and a practical). For details of days, times and rooms consult the [timetables webpage](#).

Note that tutorials and practicals commence in week 2.

Please note that you are **required** to submit tutorial work each week, **required** to submit both assignments and **expected** to attend most of the tutorials and practicals. Failure to do so may result in you failing the unit (see the precise [requirements](#)) or being excluded from the exam (see the [rule](#)).

Resources to assist your learning

iLecture

Digital recordings of lectures are available [here](#). Read instructions [here](#).

Textbook

The textbooks for ISYS114 used this semester are:

Systems Analysis and Design 10th Edition, Gary B Shelly, Harry J Rosenblatt, Shelly Cashman Series, Cengage Learning, ISBN 9781285171340

Modern Database Management Global Edition 11th edition, Jeffrey A. Hoffer, V. Ramesh, Heikki Topi ISBN: ISBN 9780273779285

Technology

MS Word, PowerDesigner, Oracle

Websites

The web page for this unit can be found at <http://www.comp.mq.edu.au/units/isys114>.

Discussion Boards

The unit makes use of discussion boards hosted within iLearn. Please post questions of general interest there (for example, about assessment tasks), they are monitored by the staff on the unit.

Staff-Student Liaison Committee

The Department has established a Staff-Student Liaison Committee at each level (100, 200, 300) to provide all students studying a Computing unit the opportunity to discuss related issues or problems with both students and staff.

100-Level Liaison Meeting The committee meets three times during the semester. For each meeting, an agenda is issued and minutes are taken. These are posted on the web at <http://www.comp.mq.edu.au/units/100-liaison>

If you have exhausted all other avenues, then you should consult the Director of Teaching (Dr. Christophe Doche) or the Head of Department (Prof. Bernard Mans). You are entitled to have your concerns raised, discussed and resolved.

Student Support Services

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at <http://www.student.mq.edu.au>.

Unit Schedule

Topic List (Note: The dates below indicate the day and evening lectures every week).

Week	Topic	Reading/ Chapter
1 30.7-1.8.2013 (Kavakli)	Systems Planning I: Introduction to Systems Analysis and Design	Shelly 1, Hoffer 1

2 6.8-8.8.2013 (Kavakli)	Systems Planning II: Analysing the Business Case, Introduction to Assignment 1	Shelly 2
3 13.8-15.8.2013 (Kavakli)	Systems Analysis I: Requirements Modeling and Modeling Tools	Shelly 4
4 20.8-22.8.2013 (Kavakli)	Systems Analysis II: Data and Process Modelling	Shelly 5-6
5 27.8-29.8.2013 (Kavakli)	System Design I: Modeling Data in the Organisation and The Enhanced Entity-Relationship Model	Hoffer 2-3
6 3.9-5.9.2013 (Kavakli)	System Design II: Logical Database Design and the Relational Model Assignment1 due	Hoffer 4-5
7 10.9-12.9.2013 (Mansour)	Implementation I: Introduction to SQL, Introduction to Assignment 2	Hoffer 6
8 1.10-3.10.2013 (Mansour)	Implementation II: Advanced SQL, Feedback on Assignment 1	Hoffer 7
9 8.10-10.10.2013 (Mansour)	Database Development I: Database Application Development and Data Warehousing	Hoffer 8-9
10 15.10-17.10.2013 (Mansour)	Database Development II: Data Quality and Integration, and GreenIT	Hoffer 10
11 22.10-24.10.2013 (Mansour)	Advanced Database Topics I: Data and Database Administration, Assignment2 due	Hoffer 11
12 29.10-31.10.2013 (Mansour)	Advanced Database Topics II: Distributed Databases, Object-Oriented Databases, Object-Relational Databases	Hoffer 12-14
13 5.11-7.11.2013 (Kavakli)	Revision, Feedback on Assignment 2	

Learning and Teaching Activities

Lectures

Lectures from staff

Mixed Classes

Tutorials and practicals supervised by tutors to provide personalised feedback and an interactive learning environment

Tutorial submission

Submission of answers to tutorial questions

Assignment submission

Submission of assignments related to specific tasks

Final Examination

Assessment of individual learning

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://www.mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy <http://www.mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://www.mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Special Consideration Policy http://www.mq.edu.au/policy/docs/special_consideration/policy.html

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

ASSESSMENT PROCEDURE

A more detailed description of each task is given below.

Tutorial Submissions

Each week, a set of exercises will be made available online. All the questions will be discussed during your tutorial class. You are expected to submit answers to the online tutorial question(s) on ilearn before 12 noon on the Monday of the following week. Your submission will be marked by your tutor (out of 1 mark). There will be 10 exercises worth 1 mark each. It is possible to achieve 10 marks.

Assignments

There are 2 assignments.

1. The first assignment requires you to apply and develop your understanding of system analysis and data modeling concepts and submit a professionally presented document demonstrating the use of data modeling skills. The document must be prepared using a standard word processor such as Word and a CASE tool such as Power Designer.
2. The second assignment assesses your ability to design a database and provide interactive queries.

These will be submitted and marked online.

You are encouraged to:

- set your personal deadline earlier than the actual one;
- keep backups of all your important files;
- make sure that no-one else picks up your printouts.

If you cannot submit on time because of illness or other circumstances, please contact the lecturer **before** the due date.

No extensions will be granted. Late assignments will be accepted up to 72 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.

Final Examination

For this unit, a final examination will test your learning and knowledge of learning outcomes #1, #2, #3 and #4. The final examination accounts for 50% of the final mark.

Regarding the examination process, note that

- you must attend all required classes and submit all required assessment, otherwise the Executive Dean of the Faculty or delegated authority has the power to refuse permission to attend the final examination.
- the University Examination period in for Second Half Year is mid November to mid December.
- you are expected to present yourself for examination at the time and place designated in the [University Examination Timetable](#).
- the timetable will be available in Draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of examinations.
- no early examinations for individuals or groups of students will be set. All students are expected to ensure that they are available until the end of the teaching semester, that is the final day of the official examination period.
- the only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for [Special Consideration](#).

Standards

Four standards, namely Developing, Functional, Proficient, and Advanced, summarize as many different levels of achievement. Each standard is precisely defined to help students know what

kind of performance is expected to deserve a certain grade. Typically, Developing corresponds PC, Functional is for P, Proficient for Cr, and Advanced covers D and HD. The standards corresponding to the learning outcomes and criteria of this unit are given below:

	Standards			
Criteria for L.O. #1	Developing	Functional	Proficient	Advanced
Analysis and Modeling	Has limited understanding and ability to apply analysis, modeling and programming concepts and techniques. Assignment and exam performance shows functional level of understanding on some but not all assessment tasks.	Demonstrates knowledge of terms and core concepts. Assignment and exam performance shows basic understanding and ability to apply most of the systems analysis, data modeling and programming concepts and techniques.	Understands most of the data modelling concepts and can apply them appropriately. Implements most of the tasks specified. Assignment and exam performance shows good understanding of data analysis and modeling concepts and application of these skills in conceptual database design.	Shows depth of understanding of data analysis and modeling concepts and implements all tasks as specified with professional presentation. Assignment and exam performance shows critical thought and comprehension of the software development big picture and related issues and activities.
Criteria for L.O. #2				
Data Base	Inaccurate reproduction of definitions and ideas, show limited understanding of database principles. Able to apply some of the basic database functionality in the assignments and final exam.	Reproduce definitions and ideas, show some breath of understanding of Database principles. Able to apply most of the basic database functionality in the assignments and final exam.	Show breath of understanding of database principles. Able to apply most of database functionality in the assignments and final exam.	Apply terminology and ideas in some new contexts, show some depth of understanding of database principles. Able to apply most of database functionality in the assignments and final exam.
Criteria for L.O. #3				
Ethics	Assessment performance shows limited understanding of what ethics is.	Assessment performance shows an understanding of what ethics involves.	Assessment performance shows an appreciation of the impact of ethics on professional practice	Assessment performance shows a deep appreciation of the impact of ethics on professional practice.
Criteria for L.O. #4				
Use of modeling tools	Assignment and exam performance shows limited understanding of data analysis and data modelling techniques and tools for introductory level database design and requirements specification.	Assignment and exam performance shows basic understanding and ability to use data analysis and modeling tools.	Assignment and exam performance shows good understanding of data analysis and modeling tools in conceptual database design.	Assignment and exam performance shows depth of understanding of data analysis and modeling tools.

Grading

For each task, those standards translate into a mark and the different component marks are added up. You will then be given a grade that reflects your achievement in the unit. The following description of the different grades is still in draft form and therefore not official as yet

- **Fail (F)**: does not provide evidence of attainment of all learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; and incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.
- **Pass (P)**: provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; and communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.
- **Credit (Cr)**: provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; plus communication of ideas fluently and clearly in terms of the conventions of the discipline.
- **Distinction (D)**: provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.
- **High Distinction (HD)**: provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application.

In particular, you will pass the unit if you,

- submit a satisfactory ($\geq 50\%$ of possible marks) attempt at both assignments
- perform at a functional level or above in final exam

Administration

Macquarie is developing a number of policies in the area of learning and teaching. Approved policies and associated guidelines can be found at [Policy Central](#). Refer to the [Science Centre](#) regarding the implementation of these policies (e.g. precise procedures, forms, deadlines, etc).

Special Consideration

Special Consideration is intended for a student who is prevented by serious and unavoidable disruption from completing any unit requirements in accordance with their ability. This [application form](#) needs to be filled and submitted to the Science centre along with some evidence to support your case. Depending on the circumstances presented, the convenor may choose to give you an alternate assessment, additional time for an assessment, make-up exam, etc. If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period. **For details of the Special Consideration policy specific to the Department of Computing, see the Department's [policy page](#).**

Grade Appeal

In case of problems arising with your final grade, the first step is to organise a review. The Department recommends that you request an appointment with the convenor of the unit in order to review your grade. If the review does not solve the problem, a formal Grade Appeal can be lodged. See the [grade appeal policy](#).

Academic Honesty and Plagiarism

Plagiarism involves using the work of another person and presenting it as one's own. The Department, in line with [University policy](#), treats all cases seriously. In particular, the Department keeps a record of all plagiarism cases. This record is referred to so that an [appropriate penalty](#) can be applied to each case.

Student Support

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at: <http://students.mq.edu.au/support/>

UniWISE provides:

- Online learning resources and academic skills workshops http://www.students.mq.edu.au/support/learning_skills/
- Personal assistance with your learning & study related questions.
- The Learning Help Desk is located in the Library foyer (level 2).
- Online and on-campus orientation events run by Mentors@Macquarie.

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

Details of these services can be accessed at <http://www.student.mq.edu.au/ses/>.

IT Help

If you wish to receive IT help, we would be glad to assist you at <http://informatics.mq.edu.au/help/>.

When using the university's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students and it outlines what can be done.

Graduate Capabilities

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

- Analyse system requirements and design and develop system models.
- Implement system models into databases, design and create simple databases for business information systems and write programs to produce interactive queries.
- Use data analysis and data modelling techniques and tools for introductory level database design and requirements specification.

Assessment tasks

- Assignment 1
- Assignment 2
- Tutorial Submission
- Final Exam

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

- Analyse system requirements and design and develop system models.
- Implement system models into databases, design and create simple databases for business information systems and write programs to produce interactive queries.
- Use data analysis and data modelling techniques and tools for introductory level database design and requirements specification.

Assessment tasks

- Assignment 1
- Tutorial Submission
- Final Exam

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

- Analyse system requirements and design and develop system models.
- Implement system models into databases, design and create simple databases for business information systems and write programs to produce interactive queries.

Assessment tasks

- Assignment 1
- Assignment 2
- Tutorial Submission
- Final Exam

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

- Use data analysis and data modelling techniques and tools for introductory level

database design and requirements specification.

Assessment tasks

- Assignment 1
- Assignment 2

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

- Analyse system requirements and design and develop system models.
- Use data analysis and data modelling techniques and tools for introductory level database design and requirements specification.

Assessment tasks

- Assignment 1
- Tutorial Submission
- Final Exam

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcome

- Explain the role and nature of ethics and sustainability in the IT environment.

Assessment tasks

- Tutorial Submission
- Final Exam

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcome

- Explain the role and nature of ethics and sustainability in the IT environment.

Assessment tasks

- Tutorial Submission
- Final Exam