



MONASH University
Information Technology

FIT9003
Database systems design

Unit Guide

Semester 1, 2010

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

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FIT9003 Database systems design - Semester 1, 2010

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Additional communication information:

In addition to the staff contact details included here, teaching staff for the unit will regularly monitor and provide feedback on the various discussion forums hosted on the unit's Moodle site. Students are encouraged to post questions, comments and answers to these forums regularly.

In particular, off-campus students are encouraged to post their tutorial work to the relevant Moodle discussion forum for feedback from both staff and students.

Introduction

Welcome to FIT9003 Database Systems Design. This 6 point unit is core for all graduate and postgraduate degree programs in the Faculty of IT. The unit has been designed to give you the knowledge to design database systems to solve organisational information requirements. It focuses on design techniques that will allow you to elicit requirements from clients, and design and document solutions.

We have a mixture of students enrolled in this unit: some with a technical background, others with a non-technical background. While the unit is specifically focussed on the design of technical systems, it has been developed with these two different backgrounds in mind. Those from a technical background will learn about the importance of good design informing good implementation, while those from a non-technical background will pick up conceptual tools that will help them think about organising data and information in a new, complementary way.

Unit synopsis

This unit is designed to introduce students to the fundamental concepts necessary for the analysis, design, use and implementation of business information systems using relational database management systems. The main topics covered include requirements elicitation, systems analysis and design informed by a lifecycle based methodology, motivation for the database approach to managing information, conceptual modelling, coverage of logical process and data models (hierarchical, network and relational data models), and the use of SQL and other facilities provided by database management systems.

Learning outcomes

At the completion of this unit, students will have -

A knowledge and understanding of:

- the purpose of requirements specification, of functional modelling of processes and data, and of the database concept;
- the relational database model;
- how to allow them to apply integrity constraints and business rules to a system design and implementation based around an enterprise level database management system.

Developed attitudes that enable them to:

- understand business information systems as the implementation of company policies and objectives;
- respect the points of view of both technical and business actors in the system development process.

Developed the skills to:

- undertake the functional modelling of processes and data for a business problem;

design and implement a database;

- implement integrity constraints and business rules in a database;
- write queries in SQL to maintain and use a relational database.

Demonstrated the communication skills necessary to:

- communicate requirements for business functionality in terms of data required, management of that data and its processing;
- work co-operatively in a professional systems development team.

Contact hours

2 hrs lectures/wk, 2 hrs laboratories/wk

Workload

For on campus students, workload commitments are:

- two-hour lecture and
- two-hour tutorial (or laboratory) (requiring advance preparation)
- a minimum of 2-3 hours of personal study per one hour of contact time in order to satisfy the reading and assignment expectations.
- You will need to allocate up to 5 hours per week in some weeks, for use of a computer, including time for newsgroups/discussion groups.

Off-campus students will not be expected to attend lectures or tutorial sessions, but lectures will be audio-recorded, and made available via both a unit Podcast as well as the Library's Monash University Lectures Online (MULO) service. All tutorial exercises and solutions will be posted to the unit's Moodle site (see below for access details). Off-campus students should plan to spend equivalent time working on these resources, and should seek advice from the Gippsland lecturer when needed. Students are encouraged to post their tutorial solutions to the Moodle discussion forums for feedback.

Unit relationships

Prohibitions

CSE9002, BUS3112, BUS4112, IMS9001, IMS9003, GCO9804, BUS9003, BUS5071, FIT1004, FIT2010, FIT9012, FIT9019

Teaching and learning method

Teaching approach

Teaching and learning in the unit involves:

- Lectures
- Tutorials
- Discussion forums
- Weekly reading
- Personal study between classes on a weekly basis.

All students are able to access the MULO video recordings of the weekly lectures. Off-campus student tutorials will be supported with discussion groups, chat and video podcasts.

Timetable information

For information on timetabling for on-campus classes please refer to MUTTS, <http://mutts.monash.edu.au/MUTTS/>

Tutorial allocation

On-campus students should register for tutorials/laboratories using the Allocate+ system: <http://allocate.its.monash.edu.au/>

Off-Campus Learning or flexible delivery

Resources for the unit will be made available in the unit's Moodle site. You will be able to watch the lecture recordings for the on-campus lectures and discuss unit material on the Moodle discussion forums. In addition to the MULO recordings of lectures, the unit has a podcast that will also be available for subscription through software such as iTunes. Episodes covering tutorial materials and other topics as needed will be released weekly through the semester.

Weekly tutorial discussions will be supported in the Moodle site, and supplementary sessions may be held using chat and video conferencing, according to student preferences.

It is important that off-campus students stay up-to-date with the unit schedule throughout the semester, and seek feedback and advice on a regular basis.

Unit Schedule

Week	Date*	Topic	References/Readings	Key dates
1	01/03/10	Introduction to Systems and Databases	Chapter One of the textbook	
2	08/03/10	ER Modelling Basics	Chapter Three of the textbook	
3	15/03/10	Conceptual, logical and physical models	Chapter Six of the textbook	
4	22/03/10	Advanced modelling techniques and the data dictionary	Chapters Four, Ten and Fifteen of the	

			textbook	
5	29/03/10	The Consulting Process	Chapters Eight and Nine of the textbook	Assignment 1a Due
Mid semester break				
6	12/04/10	Normalisation 1	Chapter Two of the textbook	
7	19/04/10	Normalisation 2	Chapter Thirteen of the textbook	
8	26/04/10	Introduction to SQL	Din, A. (1994) "Structured Query Language (SQL): A Practical Introduction" (free online text)	
9	03/05/10	Advanced SQL and middleware	Din, A. (1994)	Assignment 1b Due
10	10/05/10	Implementation	Chapter Twelve of the textbook	
11	17/05/10	Alternative Modelling Techniques	Chapters Seven and Sixteen of the textbook	
12	24/05/10	Design	Simsion, G. (2007) "Data Modelling: News from the Ivory Tower", The Data Administrators Newsletter, January, 2007.	Assignment 2 Due
13	31/05/10	Conclusion and Revision	Revision of past readings	

*Please note that these dates may only apply to Australian campuses of Monash University. Off-shore students need to check the dates with their unit leader.

Improvements to this unit

The weighting of assessment has been adjusted to 50% assignment work and 50% examination. This has allowed a restructure of the first assignment, which has been broken into a more manageable size with two parts.

Unit Resources

Prescribed text(s) and readings

Simsion, G.C. & Witt, G.C. (2005) *Data Modelling Essentials*, 3rd Edition, Morgan Kaufmann Publishers. The text book is available from the Monash University Book Shops. The book is also available on Amazon.com. Availability from other suppliers cannot be assured. The Bookshop orders texts in specifically for this unit. You are advised to purchase your text book early.

For material on SQL, you will find the following free, online textbook useful:

Din, A. (1994) *Structured Query Language (SQL): A Practical Introduction*, NCC Blackwell.

A copy of this text will be provided electronically via Moodle. You may also wish to purchase a basic SQL book for your own reference. Most academic and technical bookshops have an excellent range.

Recommended text(s) and readings

The following texts will be useful, but not mandatory, for studying the unit. If you have no IT background and/or are an off-campus student, it is strongly recommended that you either purchase or borrow the third of these texts:

Rob, P. & Coronel, C. (2007). *Database Systems Design, Implementation and Management*, 7th Edition, Thomson Course Technology.

Hoffer, J.A., George, J.F. & Valacich, J.S. (2005). *Modern Systems Analysis and Design*, 4th Edition, Pearson Education International/Prentice-Hall.

Hoffer, J.A Prescott, M.B. and McFadden, F.R. (2005). *Modern Database Management*, 6th Edition. Prentice-Hall/Pearson Education.

Required software and/or hardware

A drawing package such as Microsoft Visio is strongly recommended; a copy of which can be obtained from the Faculty's IT service desk. You will need access to a Windows XP or later based machine, and will also find it useful to install a copy of Microsoft SQL Server 2005 Express Edition (also available from the Faculty's IT service desk). You will also need a web browser and Microsoft Word.

To watch the podcasts you will need podcast software such as iTunes to download and play episodes. Alternatively, episodes can be manually downloaded and watched using either iTunes or other video software such as VLC.

Information about how to obtain the relevant database software from Microsoft to allow connection to Monash's database server will also be provided via Moodle. You will need to install the Microsoft VPN software if you want to access the database server from off-campus (again, instructions will be provided on Moodle).

Equipment and consumables required or provided

Students studying off-campus are required to have the minimum system configuration specified by the Faculty as a condition of accepting admission, as well as the software specified above, and regular Internet access. On-campus students, and those studying at supported study locations may use the

facilities available in the computing labs, as well as installing the software detailed above on a home machine to allow for study and assignment work off-campus. Information about computer use for students is available from the ITS Student Resource Guide in the Monash University Handbook. You will need to allocate up to 4 hours per week for use of a computer, including time for newsgroups/discussion groups.

Study resources

Study resources we will provide for your study are:

The FIT9003 web site on Moodle, where lecture slides, weekly tutorial exercises, assignment specifications, sample solutions, supplementary materials and discussion forums can be found. Lectures will also be video recorded (slides and audio only) and can be accessed via <http://www.mulo.monash.edu.au/> as downloads or subscribed to as a podcast. A separate FIT9003 podcast will also be published containing video of tutorial tutorial exercise walkthroughs, class discussion and other supplementary material.

Assessment

Overview

Examination (3 hours): 50%; In-semester assessment: 50%

Faculty assessment policy

To pass a unit which includes an examination as part of the assessment a student must obtain:

- 40% or more in the unit's examination, and
- 40% or more in the unit's total non-examination assessment, and
- an overall unit mark of 50% or more.

If a student does not achieve 40% or more in the unit examination or the unit non-examination total assessment, and the total mark for the unit is greater than 50% then a mark of no greater than 49-N will be recorded for the unit.

Assignment tasks

Assignment coversheets

Assignment coversheets are available via "Student Forms" on the Faculty website:

<http://www.infotech.monash.edu.au/resources/student/forms/>

You MUST submit a completed coversheet with all assignments, ensuring that the plagiarism declaration section is signed.

Assignment submission and return procedures, and assessment criteria will be specified with each assignment.

• Assignment task 1

Title:

Assignment 1a - Conceptual Database Design

Description:

This is the first submission for Assignment 1 where you will develop a complete specification for a database system. In this first part, you will develop a conceptual entity relationship diagram. You may also complete as much of the deliverable for Assignment 1b as you like for feedback from your tutor. The purpose of this assignment is to get feedback and refine your design before final submission in 1b.

Weighting:

10%

Due date:

Week 5 of Semester, during your tutorial.

Remarks:

The due date may be subject to change - see the assignment specification for the final submission date.

- **Assignment task 2**

Title:

Assignment 1b - Database Design

Description:

You will submit your final database design including conceptual model, normalised model, logical model and data dictionary, incorporating feedback from Assignment 1a in your design.

Weighting:

30%

Due date:

Week 9 of Semester, during your tutorial

Remarks:

The due date may be subject to change - see the assignment specification for the final submission date.

- **Assignment task 3**

Title:

Assignment 2 - SQL

Description:

You will write a number of SQL queries and commands

Weighting:

10%

Due date:

Week 12 of Semester, during your tutorial

Remarks:

The due date may be subject to change - see the assignment specification for the final submission date.

Examination

- **Weighting:** 50%

Length: 3 hours

Type (open/closed book): closed book

See Appendix for End of semester special consideration / deferred exams process.

Due dates and extensions

Please make every effort to submit work by the due dates. It is your responsibility to structure your study program around assignment deadlines, family, work and other commitments. Factors such as normal work pressures, vacations, etc. are not regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

Students requesting an extension for any assessment during semester (eg. Assignments, tests or presentations) are required to submit a Special Consideration application form (in-semester exam/assessment task), along with original copies of supporting documentation, directly to their lecturer within two working days before the assessment submission deadline. Lecturers will provide specific outcomes directly to students via email within 2 working days. The lecturer reserves the right to refuse late applications.

A copy of the email or other written communication of an extension must be attached to the assignment submission.

Refer to the Faculty Special consideration webpage or further details and to access application forms:
<http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>

Late assignment

Assignments received after the due date and without an extension will be subject to a penalty of 5 marks per day (ie, an assignment graded 65% would receive a mark of 55% if submitted one day late). Weekends count as a single day. Assignments more than one week late will not be accepted, and a result of 0 will be recorded.

Return dates

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later.

Appendix

Please visit the following URL: <http://www.infotech.monash.edu.au/units/appendix.html> for further information about:

- Continuous improvement
- Unit evaluations
- Communication, participation and feedback
- Library access
- Monash University Studies Online (MUSO)
- Plagiarism, cheating and collusion
- Register of counselling about plagiarism
- Non-discriminatory language
- Students with disability
- End of semester special consideration / deferred exams