



MONASH University
Information Technology

**FIT2010
Database**

Unit Guide

Semester 2, 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.

Last updated: 14 Jul 2010

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FIT2010 Database - Semester 2, 2010

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Introduction

Welcome to FIT2010 Database for Semester 2, 2010.

Databases are so widely used today that they can be found in organisations of all sizes ranging from large government agencies and business corporations to small businesses and even home use. Every day activities such as using a credit card, purchasing a product at a supermarket via a scanning checkout and internet purchases, involve application programs which consult a database to carry out tasks such as verifying a credit limit, identifying a Universal Product Code, listing the range of products available or recording an internet purchase.

FIT2010 will give you an understanding of the techniques which are used by IT professionals to design, implement and access data stored within a database.

This 6 point unit is a core unit within the Bachelor of Computer Science and the Bachelor of Software Engineering undergraduate degrees within the Faculty of IT.

Unit synopsis

This unit will provide an introduction to the principles and concepts of database systems their organisation and management. The issues of physical and logical data description are addressed. Various data models, and a query language, are introduced. This will include planning, designing, using and implementing a data model using an enterprise-scale relational database system. Methods and techniques will also be presented to populate, retrieve, update and implement integrity features on data in the implemented database system.

Learning outcomes

At the completion of this unit students will have -

A knowledge and understanding of:

- the major objectives of database technology;
- the relational model for databases and competing models;
- the phases of the database development life cycle and their correspondence to the phases of the system development lifecycle;
- the techniques and tools to design and implement a database suitable for an information system;
- a database retrieval and manipulation language;
- methods to in put place physical structures to permit efficient operation of a database; and
- the role of a database administrator.

Developed attitudes that enable them to:

- appreciate the privacy issues relating to storage of data in a database; and
- practice ethical behaviour when developing, implementing and using a database.

Contact hours

2 hrs lectures/wk, 2 hrs laboratories/wk

Workload

For on campus students, the **weekly** workload commitments are:

- two hours of lectures,
- two hours of laboratory (requiring advance preparation), and
- eight hours of self directed study - this will include reading and computer based activities.

Unit relationships

Prohibitions

FIT1004, BUS3112, CPE2005, CSE2132, CSE2138, CSE3180, CSE2316, CSE3316, GCO2815,
IMS1907, IMS2112, MMS2801

Teaching and learning method

Teaching approach

The unit will be delivered via lectures and laboratories.

Lecture: During the lecture, your lecturer will introduce key theoretical concepts and demonstrate various approaches to database tasks. The time in lectures is quite brief, please ensure you gain the best advantage from this time by:

- Prior to the lecture
 - ◆ reading the study guide for the appropriate week, and
 - ◆ downloading and reading the lecture notes,
- During the lecture
 - ◆ annotate a printed set of lecture notes as the lecture proceeds, and
 - ◆ **participate, question, seek clarification**
- After the lecture
 - ◆ read over you notes and make sure you understand the concepts
 - ◆ **seek help** if you are unsure

Laboratory: The labs consist of a set of graded exercises which allow you to put the theory presented in the lecture to work in creating, designing and using databases. The labs will also include issues that you will need to discuss with your fellow classmates and tutors. Before the lab you should carefully read through the lab activities. The teaching staff will presume that you have completed all the posted lab tasks each week and build subsequent activities on this assumption. For this reason it is very important that you complete all the posted tasks (**please note you will not be able to complete them in the allocated 2 hours, these will be completed in your self study 8 hours**). Given the cumulative nature of the learning, it is easy to fall behind if either you do not complete the required work or fail to understand key tasks/concepts. If you are having problems with lab exercises, please ensure you **speak to your tutor** and gain some assistance.

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/>

Unit Schedule

Week	Date*	Topic	Study guide	Key dates
1	19/07/10	Introduction to Database Systems	Study Guide 1	
2	26/07/10	The Relational Database Model	Study Guide 2	
3	02/08/10	DBLC and Conceptual Design	Study Guide 3	Assignment 1 Due (3PM Friday)

4	09/08/10	Normalisation	Study Guide 4	
5	16/08/10	Logical Design	Study Guide 5	
6	23/08/10	DDL and Database Design Case Study	Study Guide 6	
7	30/08/10	Structured Query Language (SQL): DML	Study Guide 7	Assignment 2 Due (3PM Friday)
8	06/09/10	Structured Query Language (SQL): DML Continued	Study Guide 8	
9	13/09/10	Structured Query Language (SQL): DDL and DCL	Study Guide 9	
10	20/09/10	Transaction Management	Study Guide 10	
Mid semester break				
11	04/10/10	Physical Design	Study Guide 11	
12	11/10/10	Database Administration	Study Guide 12	Assignment 3 Due (3PM Friday)
13	18/10/10	Revision		

*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

New group assessment procedures involving peer assessment will be further developed to assist with evaluating group work.

Unit Resources

Prescribed text(s) and readings

Rob, P., Morris, S. and Coronel, C., *Database Systems* 9th Edn., Cengage Learning, 2010

Text books are available from the [Monash University Book Shops](#). 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.

Recommended text(s) and readings

Required software and/or hardware

This unit will make use of the Oracle 10G database running on the Monash ITS server zebra.its.monash.edu.au. All students will have an account on this sever which will suffice for all database work this semester.

Although it is not required, if students wish to run a database server at home they can download Oracle XE from the unit Moodle site or directly from the Oracle technet site:

- <http://www.oracle.com/technology/software/products/database/xe/index.html>

Please note:

1. for technet, registration (free) is required, and
2. this is a large download (around 200Mb) and **should not be attempted** without first consulting your campus lecturer.

The client software for accessing Oracle (SQLDeveloper) will be available in the labs. It will also be available via a download from the Moodle site for installation at home. SQLDeveloper is also available, after registration (free), from the technet site:

- <http://www.oracle.com/technology/software/products/sql/index.html>

For database design we will be making use of Power*Architect from SQLPower:

- <http://www.sqlpower.ca/page/architect>

Equipment and consumables required or provided

On-campus students, and those studying at supported study locations may use the facilities available in the computing labs. Information about computer use for students is available from the ITS Student Resource Guide in the Monash University Handbook.

Study resources

Study resources we will provide for your study are:

Study resources we will provide for your study are:

- Weekly detailed lecture notes outlining the learning objectives, discussion of the content, required readings and exercises;
- Weekly laboratory tasks and exercises with sample solutions provided two weeks later;
- Assignment specifications and sample solutions;
- A sample examination and suggested solution
- Access to past examination papers;
- Discussion groups;
- This Unit Guide outlining the administrative information for the unit;
- The unit web site on Moodle, where resources outlined above will be made available.

Assessment

Overview

Examination (3 hours): 60%; In-semester assessment: 40%

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.

In addition to the Faculty assessment standard described above, to pass this unit, students **must attempt all three practical assignments**.

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 submission and preparation requirements will be detailed in each assignment specification. Submission must be made by the due date otherwise penalties will be enforced. You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process: <http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>.

• Assignment task 1

Title:

Assignment 1: Relational Algebra

Description:

This task, which will be carried out during the week 2 lab, will involve the use of relational algebra commands to manipulate data. This task is an individual task.

Weighting:

5%

Criteria for assessment:

1. relational algebra commands run correctly and output desired result set
2. created DBS meets the problem specifications

3. where relevant, submitted commands demonstrate an understanding of optimisation

Due date:

3PM Friday 6th August 2010

• **Assignment task 2**

Title:

Assignment 2: Database Design

Description:

Students will be supplied with a case study and asked to model this using Entity Relationship modelling. You will test your design by implementing your final logical ERD in Oracle via a set of 'create table' statements. This task is a group assignment in which students will work in groups of two (both students **must** be studying FIT2010).

Weighting:

15%

Criteria for assessment:

Task criteria:

1. Correct application of normalisation process with use of dependency diagrams at each normal form
2. Correct Logical ERD model created including - entities, PK's, attributes, relationships (connectivity and participation)
3. Generated Oracle schema file executes correctly against Oracle to produce valid database structure
4. Group presentation to marker

Group criteria:

- ◆ As a member of the group students will be required to participate fully and work with their partner in a positive manner; they will be required to make every effort to resolve any issues that arise within the group. If a matter cannot be resolved the tutor will be contacted immediately and informed of the issue/s;
- ◆ If a member of a team does not participate adequately, the tutor will be informed and will take appropriate action;
- ◆ Individual final grades will reflect the quality of a students work and participation within the group. Students will be required to submit a peer review report on both group members contribution and effort as part of their assignment submission.

Due date:

3PM Friday 3rd September 2010

• **Assignment task 3**

Title:

Assignment 3: Database Implementation

Description:

Students will be supplied with a database design via a schema file and asked to create the database under Oracle. The created database will be populated with appropriate student generated data and then used to develop a set of SQL queries and triggers. The task will also involve coding PL/SQL procedures to meet a problem specification. This task is a group assignment in which students will work in the same group they worked in for assignment 2.

Weighting:

20%

Criteria for assessment:

Task criteria:

1. Student data must insert correctly and result in a consistent database state
2. SQL queries must execute correctly and produce correct visible output
3. Coded PL/SQL triggers and procedures must compile and meet the problem specifications
4. Design modifications must execute correctly and meet the problem specifications

Group criteria:

- ◆ As a member of the group students will be required to participate fully and work with their partner in a positive manner; they will be required to make every effort to resolve any issues that arise within the group. If a matter cannot be resolved the tutor will be contacted immediately and informed of the issue/s;
- ◆ If a member of a team does not participate adequately, the tutor will be informed and will take appropriate action;
- ◆ Individual final grades will reflect the quality of a students work and participation within the group. Students will be required to submit a peer review report on both group members contribution and effort as part of their assignment submission.

Due date:

3PM Friday 15th October 2010

Examination

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Weighting:

60%

Length:

3 hours

Type (open/closed book):

closed book

Electronic devices allowed in the exam:

None

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 will be subject to a penalty of 5% per day, including weekends. Assignments received later than one week (seven days) after the due date will not normally be accepted. In some cases, this period may be shorter if there is a need to release sample solutions.

The only exception to this is in the case of illness or other serious cause. In any such cases, proper third party documentation (e.g. a doctor's certificate) will have to be supplied.

This policy is strict because comments or guidance will be given on assignments as they are returned, and sample solutions may also be published and distributed, after assignment marking or with the returned assignment.

Return dates

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

Feedback

Types of feedback you can expect to receive in this unit are:

Informal feedback on progress in labs/tutes

Graded assignments with comments

Interviews

Quiz results

Solutions to tutes, labs and assignments

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