



MONASH University

**FIT2010
Database**

Unit Guide

Semester 2, 2009

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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Introduction

Welcome to FIT2010 Database for Semester 2, 2009.

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 knowledge and understanding of:

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

At the completion of this unit students will have developed attitudes that enable them to:

1. Appreciate the privacy issues relating to storage of data in a database;
2. Practice ethical behaviour when developing, implementing and using a database.

Contact hours

4 x contact hrs/week

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

BUS2112, BUS3112, CPE2005, CSE2132, CSE2138, CSE2180, CSE3180, CSC3161, CSE2316, CSE3316, GCO2815, IMS1907, IMS2112, MMS2801

Relationships

FIT2010 is a core unit in the BCS and BSE degrees.

You may not study this unit and FIT1004, BUS3112, CPE2005, CSE2132, CSE2138, CSE2316, CSE3180, CSE3316, GCO2815, IMS1907, MMS2801 in your degree.

Teaching and learning method

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.cc.monash.edu.au/>

Unit Schedule

| Week | Topic | Study guide | Key dates |
|------|----------------------------------|---------------|---------------------------|
| 1 | Introduction to Database Systems | Study Guide 1 | |
| 2 | The Relational Database Model | Study Guide 2 | |
| 3 | The Database Design Lifecycle | Study Guide 3 | Assignment 1 Due (Friday) |
| 4 | Conceptual Design | Study Guide 4 | |
| 5 | Normalisation and Logical Design | Study Guide 5 | |
| 6 | Database Design Case Study | Study Guide 6 | |

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| | | | |
|--------------------|--|----------------|---------------------------|
| 7 | Structured Query Language (SQL): DML | Study Guide 7 | Assignment 2 Due (Friday) |
| 8 | Structured Query Language (SQL): DML Continued | Study Guide 8 | |
| 9 | Structured Query Language (SQL): DDL and DCL | Study Guide 9 | |
| 10 | Transaction Management | Study Guide 10 | |
| Mid semester break | | | |
| 11 | Physical Design | Study Guide 11 | |
| 12 | Database Administration | Study Guide 12 | Assignment 3 Due (Friday) |
| 13 | Revision | | |

Unit Resources

Prescribed text(s) and readings

Rob, P. and Coronel, C., *Database Systems* 8th Edn., Thomson Course Technology, 2009

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:

- 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;

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- 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

Practical work: 40%; Examination (3 hours): 60%.

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 44% then a mark of no greater than 44-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 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.

Weighting:

5%

Due date:

Friday 7th August 2009

• 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

Weighting:

15%

Due date:

Friday 4th September 2009

• **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.

Weighting:

20%

Due date:

Friday 16th October 2009

Examination

- **Weighting:** 60%

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 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.

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