MONASH University
Information Technology

FIT1004
Data management

Unit Guide

Semester 2, 2015

Last updated: 16 Jul 2015

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FIT1004 Data management - Semester 2, 2015

This unit will provide an introduction to the concepts of database design and usage and the related issues of data management. Students will develop skills in planning, designing, and implementing a data model using an enterprise-scale relational database system (Oracle). Methods and techniques will also be presented to populate, retrieve, update and implement integrity features on data in the implemented database system.

Manipulation of a database necessarily raises issues of data collection/creation and management, data rights (ownership, copyright, access, privacy etc) and data curation, which this unit will also address.

Mode of Delivery

- Caulfield (Day)
- Clayton (Day)
- Clayton (Online)
- Malaysia (Day)
- South Africa (Day)

Workload Requirements

Minimum total expected workload equals 12 hours per week comprising:

(a.) Contact hours for on-campus students:

- Two hours lectures
- Two hours laboratories

(b.) Study schedule for off-campus students:

- Off-campus students generally do not attend lecture, tutorial and laboratory sessions, however should plan to spend equivalent time working through the relevant resources and participating in discussion groups each week.

(c.) Additional requirements (all students):

- A minimum of 8 hours independent study per week for completing lab and project work, private study and revision.

See also Unit timetable information

Additional workload requirements

Pre-lecture reading and attempting exercises is a wise thing for all students to do. Students can expect this to be assessed.

Important: Please see the "Other" section at the end of this Unit Guide for more details.

Unit Relationships

Prohibitions

BUS3112, CPE2005, CSE2132, CSE2138, CSE2316, CSE3180, CSE3316, FIT2010, GCO2815, IMS1907, IMS2112, MMS2801

Chief Examiner

Dr Maria Indrawan-Santiago

Campus Lecturer

Caulfield

Grace Rumantir

Consultation hours: TBA

Clayton

Manoj Kathpalia

Consultation hours: TBA

South Africa

Serestina Viriri

Consultation hours: TBA

Malaysia

Mohammad Reza Zare

Consultation hours: TBA

Tutors

Caulfield

Leslie Hughes

Consultation hours: TBA

Clayton

Leslie Hughes

Consultation hours: TBA

Your feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through the Student Evaluation of Teaching and Units (SETU) survey. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, see:

www.monash.edu.au/about/monash-directions/ and on student evaluations, see:
www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html

Previous Student Evaluations of this Unit

Based on previous student feedback this unit is considered to be well structured and no significant changes have been made for this semester.

If you wish to view how previous students rated this unit, please go to
https://emuapps.monash.edu.au/unitevaluations/index.jsp

Academic Overview

Learning Outcomes

At the completion of this unit, students should be able to:

1. explain the motivations behind the development of database management systems;
2. describe the underlying theoretical basis of the relational database model and apply the theories into practice;
3. develop a sound database design;
4. develop a database based on a sound database design;
5. construct queries that meet user requirements;
6. use data modelling and database development tools effectively.

Unit Schedule

Week	Activities	Assessment
0	Please check the Moodle site: http://moodle.vle.monash.edu/	No formal assessment or activities are undertaken in week 0
1	Introduction to Data Management (and Peer Instruction)	Peer Instruction Participation is assessed weekly during lectures
2	Relational Model	Pre-lecture Quiz Questions due weekly prior to the lecture (Weeks 2 to 11), Peer Instruction Participation due weekly (Weeks 2 to 11)
3	SQL Data Definition	
4	SQL Query 1 - single and multiple tables retrieval	
5	SQL Query 2 - aggregate function and group by clause	
6	SQL Query 3 - subquery and Oracle function	Unit Test 1 (in the tutorial timeslots)
7	Oracle Triggers	
8	Database Design 1 - Design Process and Conceptual Modeling	Unit Test 2 (in the tutorial timeslots)
9	Database Design 2 - Logical Modelling	
10	Databaase Design 3 - Normalisation	Assignment 1 (Part A): Initial Conceptual Design due on Moodle Monday 5 October 2015
11	Transactions Management and Database Maintenance	
12	Current trends in database management and exam preparation	Assignment 1 (Part B): Full Database Design due due on Moodle Friday 23 October 2015
	SWOT VAC	No formal assessment is undertaken in SWOT VAC
	Examination period	LINK to Assessment Policy: http://policy.monash.edu.au/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html

*Unit Schedule details will be maintained and communicated to you via your learning system.

Teaching Approach

- **Lecture and tutorials or problem classes**
  This teaching and learning approach helps students to initially encounter information at lectures, discuss and explore the information during tutorials, and practice in a hands-on lab environment.
- **Peer assisted learning**
  In this unit, we will use the Peer Assisted learning approach. To maximise the learning experience for students in this approach, students are expected to read the suggested sections from the textbook prior to attending the lecture sessions. The preparation prior to the lecture is CRUCIAL to the successfull participation of students in peer assisted learning during the lecture

sessions and getting most of the learning that happens during the lecture.

The concepts and knowledge learnt through self-study prior to the lecture and the lecture sessions will be emphasized and put into practise during the tutorial classes. Students are expected to complete a number of questions and practical exercises during tutorial classes.

Assessment Summary

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

Assessment Task	Value	Due Date
Pre-lecture online quizzes	5%	Weekly. The exact due date will be announced as Moodle's quiz notification.
Peer Instruction Participation	5%	On campus: during weekly lectures (Weeks 2 to 11), off campus: weekly on Tuesday (Weeks 2 to 11)
Unit Test 1	10 %	Conducted in the tutorials in Week 6
Unit Test 2	10 %	Conducted in the tutorials in Week 8
Assignment 1 (Part A): Initial Conceptual Design	Hurdle to the submission of Assignment 1 (Part B)	Week 10 Monday 5 October 2015 on Moodle
Assignment 1 (Part B): Full Database Design	20%	Week 12 on Friday 23 October 2015 on Moodle
Examination 1	50%	To be advised

Assessment Requirements

Assessment Policy

Faculty Policy - Unit Assessment Hurdles
(http://intranet.monash.edu.au/infotech/resources/staff/edgov/policies/assessment-examinations/assessment-hurd

Academic Integrity - Please see resources and tutorials at
http://www.monash.edu/library/skills/resources/tutorials/academic-integrity/

Assessment Tasks

Participation

- **Assessment task 1**

   Title:
   Pre-lecture online quizzes
   Description:
   Learning Outcomes: 1, 2, 3, 4, 5

   Students will be asked to complete online quizzes in Moodle based on the prescribed
   reading of the week from weeks 2 to 11. The due date and time will be posted in Moodle.

   Weighting:
   5%
   Criteria for assessment:
   Correctness of the answers. The mark is the average mark of all the quizzes.
   Due date:
   Weekly. The exact due date will be announced as Moodle's quiz notification.

- **Assessment task 2**

   Title:
   Peer Instruction Participation
   Description:
   Learning Outcomes: 1, 2, 3, 4, 5

   Participation will be marked during lectures.
   Weighting:
   5%
   Criteria for assessment:
   On campus students:

   Active participation in lecture sessions using the response systems is expected. **5% of the
   final marks is allocated for this participation**. The mark will be allocated based on the
   percentage of attended lecture sessions from week 2 to 11 (10 weeks). A student is
   considered attending the lecture if he/she provided responses at least 50% to the
   available questions on that session.

   Off campus (ONLINE) students:

Throughout the semester, students are expected to submit their answer to a selected weekly (from week 2 to 11) tutorial question to the discussion forum. The weekly due date will be announced in Moodle. **5% of the final marks is allocated for this participation.** The mark will be allocated based on the number of submitted work and to certain degree the quality of the attempt.

Due date:

On campus: during weekly lectures (Weeks 2 to 11), off campus: weekly on Tuesday (Weeks 2 to 11)

• Assessment task 3

Title:

Unit Test 1

Description:

Learning Outcomes: 1, 2, 3, 4, 5

This test covers all the topics from week 1 till end of week 4.

Weighting:

10 %

Criteria for assessment:

Due date:

Conducted in the tutorials in Week 6

Remarks:

On Campus Student:

There will be a number of versions of the unit test, a student may get any one of these version to work on

Off campus (ONLINE) students:

There will be an assignment on Data Definition and Data Manipulation to be submitted online:

Task Description:Given a database and sample data, students will be required to use Oracle to create tables and populating the tables using appropriate SQL statements.

Task Criteria:

♦ Correct application of SQL statements to create table according to a given database design.
♦ Correct application of SQL statements to populate the tables using some sample data.
♦ Correct application of SQL statements to make changes to the data according to specification.

• Assessment task 4

Title:

Unit Test 2

Description:

Learning Outcomes: 1, 2, 3, 4, 5

This test covers all the topics in Week 5 and Week 6.

Weighting:

10 %
Criteria for assessment:
Due date:
Conducted in the tutorials in Week 8
Remarks:
On Campus Student:

There will be a number of versions of the unit test, a student may get any one of these version to work on

Off campus (ONLINE) students:

There will be an assignment on SQL Data Retrieval to be submitted online

Task Description:Given a database and sample data, students will be required to use Oracle to create tables and populating the tables using appropriate SQL statements.

Task Criteria:

♦ Correctness of the SQL statement in retrieving the required data.
♦ Appropriate use of SQL constructs.

• Assessment task 5

Title:
Assignment 1 (Part A): Initial Conceptual Design
Description:
Learning Outcomes: 3, 4, 5, 6

Students will be supplied with a case study and asked to model this using Entity Relationship modelling. This part of Assignment 1 will require the submission of a "beginning" conceptual design.
Weighting:
Hurdle to the submission of Assignment 1 (Part B)
Criteria for assessment:
Student designs will not be graded. Tutors will discuss with each student individually during tutorials their submitted design, against the case study, as a first stage of the database design task. This task is a hurdle requirement, students who do not submit this task will not be able to submit Assignment 1 (Part B).
Due date:
Week 10 Monday 5 October 2015 on Moodle

• Assessment task 6

Title:
Assignment 1 (Part B): Full Database Design
Description:
Learning Outcomes: 3, 4, 5, 6

Based on the feedback from Assignment 1 (Part A) and the supplied case study, students will be required to complete the database design and produce a logical model. The final design will be tested by implementing the logical Entity-Relationship Diagram (ERD) in Oracle via a set of 'create table' statements. Please note that this assignment will not be available unless you have already submitted Assignment 1 (Part A).

Assessment Requirements

Weighting:
20%
Criteria for assessment:
Task Criteria:

♦Correct application of normalisation process with use of dependency diagrams at each normal form
♦Correct Logical ERD model created including - entities, PK's, attributes, relationships (connectivity and participation)
♦Generated Oracle schema file executes correctly against Oracle to produce valid database structure
Hurdle requirements:
Satisfactory completion of Assignment 1 (Part A): Initial Conceptual Design
Due date:
Week 12 on Friday 23 October 2015 on Moodle

Examinations

• **Examination 1**

Weighting:
50%
Length:
3 hours
Type (open/closed book):
Closed book
Electronic devices allowed in the exam:
None

Learning resources

Monash Library Unit Reading List (if applicable to the unit)
http://readinglists.lib.monash.edu/index.html

Feedback to you

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

• Informal feedback on progress in labs/tutes
• Graded assignments with comments
• Test results and feedback
• Quiz results
• Solutions to tutes, labs and assignments

Extensions and penalties

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.monash.edu.au/exams/special-consideration.html

Returning assignments

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

Resubmission of assignments

At the Chief Examiner's discretion, students may be permitted to resubmit assignments where *serious* medical issues or problems have impacted a student's work.

Referencing requirements

Students are required to use the APA style of referencing for this unit - details are available from:

- http://www.lib.monash.edu.au/tutorials/citing/apa.html
- http://guides.lib.monash.edu/content.php?pid=88267&sid=656564
- Chapter 10 of the Faculty of Business and Economics Q Manual (http://www.buseco.monash.edu.au/publications/qmanual/qmanual.pdf)

Assignment submission

It is a University requirement (http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-academic-integrity-managing-pla for students to submit an assignment coversheet for each assessment item. Faculty Assignment coversheets can be found at http://www.infotech.monash.edu.au/resources/student/forms/. Please check with your Lecturer on the submission method for your assignment coversheet (e.g. attach a file to the online assignment submission, hand-in a hard copy, or use an electronic submission). Please note that it is your responsibility to retain copies of your assessments.

Online submission

Please submit your work via the learning system for this unit, which you can access via links in the my.monash portal.

Required Resources

Please check with your lecturer before purchasing any Required Resources. Limited copies of prescribed texts are available for you to borrow in the library, and prescribed software is available in student labs.

Software

If students wish to work on this unit *from home*, you will require a copy of SQL Developer. Please see the links below in Recommended Resources. Both items of software should be both readily available and free of charge - and it is suggested you obtain a copy from the Moodle unit web site.

Textbook

This text is 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.

The text is also available as an eBook from Cengage Learning. The URL to the eBook version on the Cengage site is: http://www.cengagebrain.com.au . The Cengage (CourseSmart) book format is HTML5 and thus can be read on a range of devices, markup (notes and highlighting) and a number of other functions are possible. The eReader FAQ is available from http://www.cengagebrain.com.au/shop/FAQ.html .

Prescribed text(s)

Limited copies of prescribed texts are available for you to borrow in the library.

Coronel, C. and Morris, S. (2014). *Database Systems.* (11th Edition) Cengage Learning.

Recommended Resources

This unit will make use of the Oracle 11G database running on the Monash ITS server zebra.its.monash.edu.au. All students will have an account on this server 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 (eXpress Edition) 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

Additional Recommended Learning Materials will be listed on the unit's Moodle site.

Additional subject costs

On-Campus (Clayton, Caulfield) students are required to purchase a Turning Point clicker from the Campus Bookstore or directly from the Australian Distributor.

Other Information

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at:
www.policy.monash.edu.au/policy-bank/academic/education/index.html

Faculty resources and policies

Important student resources including Faculty policies are located at
http://intranet.monash.edu.au/infotech/resources/students/

Graduate Attributes Policy

http://www.policy.monash.edu/policy-bank/academic/education/management/monash-graduate-attributes-policy.h

Student Charter

www.opq.monash.edu.au/ep/student-charter/monash-university-student-charter.html

Student services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at http://www.monash.edu.au/students. For Malaysia see http://www.monash.edu.my/Student-services, and for South Africa see http://www.monash.ac.za/current/.

Monash University Library

The Monash University Library provides a range of services, resources and programs that enable you to save time and be more effective in your learning and research. Go to www.lib.monash.edu.au or the library tab in my.monash portal for more information. At Malaysia, visit the Library and Learning Commons at http://www.lib.monash.edu.my/. At South Africa visit http://www.lib.monash.ac.za/.

Disability Liaison Unit

Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis.

- Website: http://www.monash.edu/equity-diversity/disability/index.html
- Telephone: 03 9905 5704 to book an appointment with a DLO; or contact the Student Advisor, Student Commuity Services at 03 55146018 at Malaysia
- Email: dlu@monash.edu
- Drop In: Equity and Diversity Centre, Level 1, Building 55, Clayton Campus, or Student Community Services Department, Level 2, Building 2, Monash University, Malaysia Campus

Other

Getting the most from your studies in this unit:

Lecture: During the lecture, your lecturer will conduct the peer instruction session.

- Prior to the lecture

    ♦ reading the precribed reading from the textbook
    ♦ complete the pre-lecture quiz in Moodle,
- During the lecture

    ♦ **participate by asking question and seeking clarification**
- After the lecture

    ♦ read over your notes and make sure you understand the concepts
    ♦ **seek help** if you are unsure

Laboratory/Tutorials: 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 data and 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.

Engineers Australia Stage 1 competencies

This unit is a core unit in the Bachelor of Software Engineering accredited by Engineers Australia. Engineers Australia Accreditation Policy of Professional Engineering Programs requires that programs demonstrate how engineering graduates are prepared for entry to the profession and achieve Stage 1 competencies. The following information describes how this unit contributes to the development of these competencies for the Bachelor of Software Engineering. (Note: not all competencies may be emphasised in this unit).

Stage 1 competency	How the compency is developed in this unit
1. Knowledge and Skills base	
1.1. **Comprehension, theory based understanding** of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.	Theoretical lecture materials, prescribed texts and recommended readings, tutorials and assignment tasks to cover the fundamental knowledge of database as part of the required Software Engineering Body of Knowledge (SWEBOK).
1.2. **Conceptual understanding** of the mathematics, numerical analysis, statistics, and computer and information sciences, which underpin the engineering discipline.	Theoretical materials covered in lectures, lab exercises and assignment to construct and develop databases logically.

Other Information

1.3. **In-depth understanding** of specialist bodies of knowledge within the engineering discipline.	Applies database techniques in lab exercises and assignment to construct databases.
1.4. **Discernment** of knowledge development and research directions within th engineering discipline.	Not covered in this unit.
1.5. **Knowledge** of engineering design practice and contextual factors impacting the engineering discipline.	Using lecture material, lab exercises and assignment to understand the motivation of learning and using databases in the context of software development and software engineering.
1.6. **Understanding** of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.	Not covered in this unit.

2. Engineering application ability

2.1. **Application** of established engineering methods to complex engineering problem solving.	Not covered in this unit.
2.2 **Fluent application** of engineering techniques, tools and resources.	Not covered in this unit.
2.3. **Application** of systematic engineering synthesis and design processes.	Not covered in this unit.
2.4. **Application** of systematic approaches to the conduct and management of engineering projects.	Not covered in this unit.

3. Professional and personal attributes

3.1. **Ethical** conduct and professional accountability.	Not covered in this unit.
3.2. **Effective** oral and written communication in professional and lay domains.	Assignment and lab exercises require students to produce written work. They are interviewed and asked questions about their submissions requiring them to provide answers verbally to the tutor's questions.
3.3. **Creative**, innovative and proactive demeanour.	Analyse the database requirements and then design the databases in lab classes and in their assignment. The exercises' focus is inherently a creative activity and this aspect is reinforced in lectures, lab classes and assignment.
3.4. **Professional** use and management of information.	Not covered in this unit.
3.5. **Orderly** management of self, and professional conduct.	Acting and behaving in an ethical way as a student during lab classes and assignment while developing the solutions.
3.6. **Effective** team membership and team leadership.	Not covered in this unit.

Relationship between Unit Learning Outcomes and BSE Course Outcomes

No.	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	CO 7	C0 8	CO 9	CO 10	CO 11	CO 12	CO 13
1	X	X											
2	X	X	X		X	X		X					
3	X	X	X			X		X					
4	X	X	X		X	X		X					

Other Information

5 X X X   X X   X

Relationship between Unit Learning Outcomes and Assessments

No.	Assignments	Tests	Practical Exercises	Exam
1		X	X	X
2	X	X	X	X
3	X		X	
4	X	X	X	
5	X	X	X	X