

FIT2077
Advanced data management

Unit Guide

Semester 1, 2013

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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FIT2077 Advanced data management - Semester 1, 2013

This unit extends the study from [FIT1004](#) Data management. FIT2077 will introduce more advanced concepts in the areas of database design, SQL, query optimisation and the handling of unstructured data (XML) both externally and within a database. The issue of "Big Data" and the role played by BI technologies and data warehouses will be explored.

Mode of Delivery

Caulfield (Day)

Contact Hours

2 hrs lectures/wk, 2 hrs laboratories/wk

Workload requirements

Students will be expected to spend a total of 12 hours per week during semester on this unit as follows:

- Lectures: 2 hours per week
- Tutorials/Lab Sessions: 2 hours per week per tutorial
- and up to an additional 8 hours in some weeks for completing lab and project work, private study and revision.

Unit Relationships

Prohibitions

CSE3000, FIT3118, [FIT4038](#)

Prerequisites

[FIT1004](#) or CSE2132 or equivalent

Chief Examiner

[Mr Lindsay Smith](#)

Campus Lecturer

Caulfield

Lindsay Smith

Tutors

Caulfield

Anthony Wong

Academic Overview

Learning Outcomes

At the completion of this unit students will be able to:

- design a database model, from a given scenario, using the Extended Entity Relationship model;
- demonstrate a fluency with relational algebra commands;
- create triggers, procedures and functions to enhance the logic stored in a database;
- analyse SQL query operations to optimise their performance;
- create XML documents and schemas to represent a given scenario;
- implement and manipulate XML structure in a database;
- describe the role played by Data Warehouses and Business Intelligence (BI) with respect to "Big Data".

Unit Schedule

Week	Activities	Assessment
0		No formal assessment or activities are undertaken in week 0
1	Entity Relationship Model Review	
2	Extended Entity Relationship Model	
3	SQL Review	Lab Exercise 1 due (10 marks)
4	Relational Algebra and SQL Relational set operators	
5	PL/SQL Triggers	
6	PL/SQL Procedures and Functions	
7	Indexing and Query Algorithms	Lab Exercise 2 due (10 marks)
8	Tuning and Query Optimisation	
9	Unstructured Data - XML documents	Lab Exercise 3 due (10 marks)
10	XML Schemas	
11	XML in the database	
12	Big Data - BI and Data Warehouses	Lab Exercise 4 due (10 marks)
	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.

Assessment Summary

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

Assessment Task	Value	Due Date
Lab Task 1 - EERM Design	10%	Friday 22nd March 2012
Lab Task 2 - Advanced SQL	10%	Friday 26th April 2013
Lab Task 3 - Query Optimisation	10%	Friday 10th May 2013
Lab Task 4 - Unstructured Data	10%	Friday 31st May 2013
Examination 1	60%	To be advised

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

Assessment Requirements

Assessment Policy

Faculty Policy - Unit Assessment Hurdles

([http://www.infotech.monash.edu.au/resources/staff/edgov/policies/assessment-examinations/unit-assessment-hu](http://www.infotech.monash.edu.au/resources/staff/edgov/policies/assessment-examinations/unit-assessment-hurdles))

Academic Integrity - Please see the Demystifying Citing and Referencing tutorial at

<http://lib.monash.edu/tutorials/citing/>

Assessment Tasks

Participation

• Assessment task 1

Title:

Lab Task 1 - EERM Design

Description:

From a supplied scenario students will be asked to model the situation using the Extended Entity Relationship Modelling approach. The design will then be used to generate a schema to create appropriate tables under Oracle.

Weighting:

10%

Criteria for assessment:

- ◆ 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.

Due date:

Friday 22nd March 2012

• Assessment task 2

Title:

Lab Task 2 - Advanced SQL

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 supplied data and then used to develop a set of SQL queries, triggers, procedures and functions to meet supplied user requirements.

Weighting:

10%

Criteria for assessment:

- ◆ SQL queries must execute correctly and produce correct visible output.
- ◆ Coded PL/SQL must compile and meet the problem specifications.

Due date:

Friday 26th April 2013

• **Assessment task 3**

Title:

Lab Task 3 - Query Optimisation

Description:

Students will be supplied with a set of tables and asked to optimise the performance of a number of required queries against these tables.

Weighting:

10%

Criteria for assessment:

- ◆ SQL queries must execute correctly and produce correct visible output.
- ◆ Queries must demonstrate the use of query hints to improve performance, including appropriate statistics to support the claimed improvements.

Due date:

Friday 10th May 2013

• **Assessment task 4**

Title:

Lab Task 4 - Unstructured Data

Description:

Students will be supplied with a scenario and required to represent that data through the use of XML, including authoring of an appropriate schema, both external to the database and also within Oracle.

Weighting:

10%

Criteria for assessment:

- ◆ Completed exercise must provide the output specified in the exercise brief and make optimal use of coding.

Due date:

Friday 31st May 2013

Examinations

• **Examination 1**

Weighting:

60%

Length:

3 hours

Type (open/closed book):

Closed book

Electronic devices allowed in the exam:

None

Learning resources

Monash Library Unit Reading List

<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
- 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.infotech.monash.edu.au/resources/student/equity/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 Examiners discretion, students may be permitted to resubmit assignments where *serious* medical issues or problems have impacted a students 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/plagiarism-procedures.html>) 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 online quiz).

Online submission

If Electronic Submission has been approved for your unit, please submit your work via the learning system for this unit, which you can access via links in the my.monash portal.

Recommended Resources

This unit will make use of the Oracle 11G database running on the Monash ITS server hippo.its.monash.edu. 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>

For database Design we will be making use of the community edition of Power*Architect (version 1.06) developed by SQLPower:

- <http://code.google.com/p/power-architect/>

Power*Architect will also be available in the labs, for download from the Moodle site and can be downloaded directly from the link above.

Recommended text(s)

Rob, P., Morris, S. and Coronel, C.. (2013). *Database Systems: Design, Implementation, and Management*. (10th Edition) Cengage Learning (ISBN: 1111969604).

Elmasri, R., and Navathe, S.. (2011). *Fundamentals of Database Systems*. (6th Edition) Addison-Wesley (ISBN: 0136086209).

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

Key educational policies include:

- Plagiarism;
<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-policy.html>
- Assessment in Coursework Programs;
<http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-po>
- Special Consideration;
<http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.ht>
- Grading Scale;
<http://www.policy.monash.edu/policy-bank/academic/education/assessment/grading-scale-policy.html>
- Discipline: Student Policy;
<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-discipline-policy.html>
- Academic Calendar and Semesters; <http://www.monash.edu.au/students/dates/>
- Orientation and Transition; <http://intranet.monash.edu.au/infotech/resources/students/orientation/>
- Academic and Administrative Complaints and Grievances Policy;
<http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy.h>
- Code of Practice for Teaching and Learning;
<http://www.policy.monash.edu.au/policy-bank/academic/education/conduct/suppdocs/code-of-practice-teac>

Graduate Attributes Policy

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

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 Sunway 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 Sunway, 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 Community Services at 03 55146018 at Sunway 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, Sunway Campus

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

FIT2077 and FIT4038 have been co-taught for a number of years. Previous student feedback has indicated that this is not a desirable situation. Based on this feedback, from semester 1 2013 the units have been separated and will no longer be co-taught. The FIT2077 unit content was strongly driven by the PG cohort during the co-teaching, which again student feedback indicated was not appropriate. FIT2077 has had a name change to "Advanced Data Management" and has been completely redesigned as an extension of the common core unit FIT1004 (hence the change of name).

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