

FIT2077
Advanced data management

Unit Guide

Semester 1, 2014

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Table of Contents

<u>FIT2077 Advanced data management - Semester 1, 2014</u>	1
<u>Mode of Delivery</u>	1
<u>Workload Requirements</u>	1
<u>Unit Relationships</u>	1
<u>Prohibitions</u>	1
<u>Prerequisites</u>	1
<u>Chief Examiner</u>	1
<u>Campus Lecturer</u>	1
<u>Caulfield</u>	1
<u>Your feedback to Us</u>	2
<u>Previous Student Evaluations of this Unit</u>	2
<u>Academic Overview</u>	3
<u>Learning Outcomes</u>	3
<u>Unit Schedule</u>	4
<u>Teaching Approach</u>	4
<u>Assessment Summary</u>	4
<u>Assessment Requirements</u>	5
<u>Assessment Policy</u>	5
<u>Assessment Tasks</u>	5
<u>Participation</u>	5
<u>Examinations</u>	6
<u>Examination 1</u>	6
<u>Learning resources</u>	6
<u>Feedback to you</u>	6
<u>Extensions and penalties</u>	7
<u>Returning assignments</u>	7
<u>Resubmission of assignments</u>	7
<u>Referencing requirements</u>	7
<u>Assignment submission</u>	7
<u>Online submission</u>	7
<u>Prescribed text(s)</u>	7
<u>Technological Requirements</u>	8
<u>Recommended Resources</u>	8
<u>Recommended text(s)</u>	8
<u>Examination material or equipment</u>	8
<u>Other Information</u>	9
<u>Policies</u>	9
<u>Faculty resources and policies</u>	9
<u>Graduate Attributes Policy</u>	9
<u>Student Charter</u>	9
<u>Student services</u>	9
<u>Monash University Library</u>	10
<u>Disability Liaison Unit</u>	10

FIT2077 Advanced data management - Semester 1, 2014

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)

Workload Requirements

Minimum total expected workload equals 12 hours per week comprising:

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

- Two hours of lectures
- One 2-hour laboratory

(b.) Additional requirements (all students):

- A minimum of 8 hours independent study per week 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

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 prior to 2013. Previous student feedback has indicated that this was not a desirable situation. Based on this feedback, from semester 1 2013 the units were 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 had a name change to "Advanced Data Management" and was completely redesigned, in semester 1 2013, as an extension of the common core unit FIT1004.

Student feedback based on the first offering of the unit in 2013 highlighted the strengths of the connection to, and extension of FIT1004, and the introduction of XML. In response to student feedback for this offering students will make practical use of a "Big Data" database (mongoDB).

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 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	
4	PL/SQL Triggers	Lab Exercise 1 due (10 marks)
5	PL/SQL Procedures and Functions	
6	Unstructured Data - XML documents	
7	XML Schemas	Lab Exercise 2 due (15 marks)
8	XML in the database	
9	Big Data - BI and Data Warehouses	
10	Relational Algebra and SQL Relational set operators	Lab Exercise 3 due (15 marks)
11	Indexing and Query Algorithms	
12	Tuning and Query Optimisation	
	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

Assessment Summary

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

Assessment Task	Value	Due Date
Lab Task 1 - EERM Design	10%	Thursday 27th March 2014
Lab Task 2 - Advanced SQL	15%	Thursday 17th April 2014
Lab Task 3 - Unstructured Data	15%	Thursday 15th May 2014
Examination 1	60%	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-hurdles>)

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:

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:

Thursday 27th March 2014

• 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:

15%

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:

Thursday 17th April 2014

- **Assessment task 3**

Title:

Lab Task 3 - 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:

15%

Criteria for assessment:

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

Due date:

Thursday 15th May 2014

Examinations

- **Examination 1**

Weighting:

60%

Length:

3 hours

Type (open/closed book):

Open 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>

Faculty of Information Technology [Style Guide](#)

Feedback to you

Examination/other end-of-semester assessment feedback may take the form of feedback classes, provision of sample answers or other group feedback after official results have been published. Please check with your lecturer on the feedback provided and take advantage of this prior to requesting individual consultations with staff. If your unit has an examination, you may request to view your examination script booklet, see

<http://intranet.monash.edu.au/infotech/resources/students/procedures/request-to-view-exam-scripts.html>

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.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 Examiners discretion, students may be permitted to resubmit assignments where *serious* medical issues or other 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/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 online quiz). Please note that it is your responsibility to retain copies of your assessments.

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.

Prescribed text(s)

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

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

Technological Requirements

Students are required to check regularly check Moodle for announcements and updates to unit material. Students who own a laptop (Mac or Windows) may install the unit software on their own machine and may use the laptop in class.

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>

Recommended text(s)

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

Examination material or equipment

Notes, texts and resource material may be taken into the examination. Electronic resources such as calculators and computers are not permitted.

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:

- Student Academic Integrity Policy and Student Academic Integrity: Managing Plagiarism and Collusion Procedures ;
<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-academic-integrity-policy.h>
- 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>

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 Community 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