



MONASH University
Information Technology

FIT3037
Software engineering

Unit Guide

Semester 2, 2015

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FIT3037 Software engineering - Semester 2, 2015

In this unit students will learn about many aspects of working with a large team on large projects to produce quality software products on time and within budget. The student will gain an appreciation of the tools and techniques used to develop software systems within a group context. Topics to be studied include: software development lifecycle models; sizing, estimation, planning and control of projects; functional specification and design of real-time systems; formal specification and design using Z; integration and testing strategies, configuration management; reuse and re-engineering.

Mode of Delivery

- Gippsland (Off-campus)
- South Africa (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 tutorial

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

- Off-campus students generally do not attend lecture and tutorial 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

Unit Relationships

Prohibitions

CSE2201, CSE2401, [FIT2024](#), GCO3811

Prerequisites

[FIT2005](#)

Chief Examiner

Dr David Squire

Campus Lecturer

Gippsland

Gour Karmakar

Consultation hours: Email for an appointment

South Africa

Gregory Gregoriou

Tutors

Gippsland

Gour Karmakar

South Africa

Gregory Gregoriou

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

Previous student feedback has suggested having two assignments instead of three.

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

Academic Overview

Learning Outcomes

At the completion of this unit students will have: A knowledge and understanding of:

- the continuing software crisis, problems encountered in the development of large software systems: poor quality, late delivery and budget overruns;
- techniques used in software engineering to counter these problems;
- the role of software lifecycle models in project control and planning;
- different categories of software metrics;
- software estimation methods;
- methods for specifying real-time systems;
- techniques and tools to support configuration management;
- strategies for testing software;
- the roles and responsibilities of project team members.

Developed the skills to:

- apply techniques for scheduling and control of large projects;
- construct and validate a software specification;
- formal methods specification of software systems;
- functionally design of software systems;
- describe large software systems using appropriate language and technical specification techniques to suit the intended audience;
- be aware that quality software is not a luxury but essential in solving the software crisis.

Unit Schedule

Week	Activities	Assessment
0		No formal assessment and activities are undertaken in Week 0
1	Introduction, Process models, metrics, requirements specifications	
2	Interface analysis and design	
3	Real-time Specification	
4	Formal methods introduction	
5	Formal Specification - Z	
6	System and Software Design	Assignment 1 due 3 September 2015
7	Project and risk management	
8	Software Estimation	
9	Component-based development, Cleanroom Software Engineering	
10	Software Testing and Strategies	
11	Software configuration maintenance	Assignment 2 due 15 October 2015
12	Software re-engineering	
	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 provides facilitated learning, practical exploration and peer learning.

Assessment Summary

Examination (3 hours): 55%; In-semester assessment: 45%

Assessment Task	Value	Due Date
Assignment 1: Real-time Specification	25%	3 September 2015
Assignment 2: Formal Specification - Z	20%	15 October 2015
Examination 1	55%	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:

Assignment 1: Real-time Specification

Description:

The student will analyse a proposed real-time system and present a specification that describes the system operation and constraints of the system.

Weighting:

25%

Criteria for assessment:

The full specification and criteria for the assignment will be available early in the semester from the Moodle site, a summary of the marking criteria is included here.

The major criteria and the relevant percentages are:

1. Presentation (5%). Looking for well-presented and laid out specification.
2. ERD (10%). Looking for an entity relationship diagram that shows the basic relationships between the system to be developed and the other entities in the environment.
3. DFD's and CFD's (30%). Looking for a set of data and control flow diagrams that show the data and control flows around the system. The flows must be maintained between different levels with no overall gain or loss of information.
4. PSPECS (15%). Each process at the lowest level **MUST** have a specification showing exactly what it does and how the data flowing through the process is manipulated.
5. CSPECS (20%). Basic job of Control Specification is to show how events in CFD are handled and to synchronise process activation as required. Looking for logical and consistent specification to manage this task.
6. Data Dictionary (10%). Need to include all names in dictionary, including process, data and control flow names.
7. Coverage (10%). What percentage of the overall problem has been considered in this solution.

Due date:

3 September 2015

Remarks:

This assessment relates to Learning Outcomes 1, 2, 6, 11, 13 and 14.

• **Assessment task 2**

Title:

Assignment 2: Formal Specification - Z

Description:

The student will develop a formal specification in Z for an interesting but relatively simple proposed system. This will include the specification of a suitable state space and schemas to perform operations on that state space.

Weighting:

20%

Criteria for assessment:

The full specification and criteria for the assignment will be available early in the semester from the Moodle site, a summary of the marking criteria is included here.

The major criteria and the relevant percentages are:

1. Presentation and basic layout (5%). Looking for good layout, adherence to basic Z concepts and structures.
2. State Space Specification (15%). Looking for well defined structure for all the data to be stored. Predicates to hold these structures consistent. Types to be used consistently.
3. Initialisation Schema (10%). Must ensure initialisation cannot be re-run once data input and ensure that all data initialised.
4. Schema Calculus (10%). Looking for use of schema calculus to handle error conditions and make schemas less complex. Schema calculus to handle the majority of possible error conditions.
5. Defined Schemas (60%). Schemas defined in the assignment specification to be correctly written in Z with logical and consistent manipulation of the state space and local variables.

Due date:

15 October 2015

Remarks:

This assessment relates to Learning Outcomes 1, 2, 12, 13, 14 and 15.

Examinations

• **Examination 1**

Weighting:

55%

Length:

3 hours

Type (open/closed book):

Closed book

Electronic devices allowed in the exam:

None

Learning resources

Reading list

Sommerville, Ian. Software Engineering, 10th Edition, Pearson, 2015, ISBN-10:0133943038 or ISBN-13: 978-0133943030.

Vliet, Hans Van. Software Engineering: Principles and Practice, 3rd Edition, John Wiley and Sons, 2008, ISBN-10: 0470031468 or ISBN-13: 978-0470031469.

Pfleeger, Shari Lawrence and Atlee, Joanne M. Software Engineering Theory and Practice, 4th Edition, Prentice-Hall, 2009, ISBN-10: 0136061699 or ISBN-13: 978-0136061694.

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:

- 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.

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

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.

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.

Prescribed text(s) and readings

Pressman R.S., Software Engineering: A Practitioners Approach, McGraw-Hill, 7th Edition, 2010, ISBN 978-007-126782-3 or 8th Edition, 2014, ISBN-10: 0078022126 or ISBN-13:978-0078022128.

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.

Required software and/or hardware

You will need access to a computer with Word etc. for assignment preparation. A special Z font is available from the Moodle site for development of the Z formal methods specification in Assignment 1.

Computers with MS Office are available in Computer Labs.

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 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