



**MONASH** University

**FIT3037**  
**Software engineering**

**Unit guide**

**Semester 2, 2008**

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# **FIT3037 Software engineering - Semester 2 , 2008**

## **Unit leader :**

Raymond Smith

## **Lecturer(s) :**

### **Gippsland**

- Raymond Smith

## **Tutors(s) :**

### **Gippsland**

- Raymond Smith

## Introduction

Welcome to Software Engineering!

Software engineering is a very wide ranging unit which attempts to consolidate many things you will probably have come across before (eg process models, analysis and design methods etc) and give each a better context within the overall domain. We also introduce a few distinctly different aspects that few will have seen before, these include formal methods, real-time analysis and configuration management. Overall the objective is to develop a greater understanding of the complexity and magnitude of creating very large software systems and the methods and techniques used to overcome the problems that may be encountered.

Don't hesitate to ask questions via the discussion forums, answer other students queries if you can and participate as much as possible.

Regards,

Ray

## Unit synopsis

Software engineering is much more than the ability to analyse, design and develop program code to solve particular information system problems. 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: lifecycle models, sizing, estimation, planning and control of projects, functional specification and design of real-time systems, formal specification using Z, integration and testing strategies, configuration management and re-engineering.

## Learning outcomes

At the completion of this unit, students will have:

**Knowledge 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

**Understanding of:**

- 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

**Skills in:**

- applying techniques for scheduling and control of large projects
- constructing and validating a software specification

- formal methods specification of software systems
- functional design of software systems
- describing large software systems using appropriate language and technical specification techniques to suit the intended audience

**Awareness:**

- that quality software is not a luxury but essential in solving the software crisis

## **Workload**

For on campus students, workload commitments are:

- two-hour lecture and
- two-hour tutorial (or laboratory) (requiring advance preparation)
- a minimum of 2-3 hours of personal study per one hour of contact time in order to satisfy the reading and assignment expectations.
  
- You will need to allocate up to 5 hours per week in some weeks, for use of a computer, including time for newsgroups/discussion groups.

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

## **Unit relationships**

### **Prerequisites**

You should have previously completed FIT2005 or have demonstrated equivalent learning

### **Relationships**

FIT3037 is a core unit in the Applications Development and Networks major in the BITS. It is an approved third level elective for the Business Systems major.

Before attempting this unit you must have satisfactorily completed FIT2005 or equivalent. You should have:

- the ability to analyse an information system specification and develop detailed and appropriate models;
- familiarity with the commonly used software analysis and design methodologies, including structured analysis and design and the object oriented techniques;
- basic programming skills and general familiarity with the processes involved in the development of software using languages like Java and C/C++

You may not study this unit and CSE2201 or CSE2401 or GCO3811 or FIT2024 in your degree.

## Continuous improvement

Monash is committed to 'Excellence in education' and strives for the highest possible quality in teaching and learning. To monitor how successful we are in providing quality teaching and learning Monash regularly seeks feedback from students, employers and staff. Two of the formal ways that you are invited to provide feedback are through Unit Evaluations and through Monquest Teaching Evaluations.

One of the key formal ways students have to provide feedback is through Unit Evaluation Surveys. It is Monash policy for every unit offered to be evaluated each year. Students are strongly encouraged to complete the surveys as they are an important avenue for students to "have their say". The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

## Student Evaluations

The Faculty of IT administers the Unit Evaluation surveys online through the my.monash portal, although for some smaller classes there may be alternative evaluations conducted in class.

If you wish to view how previous students rated this unit, please go to <http://www.monash.edu.au/unit-evaluation-reports/>

Over the past few years the Faculty of Information Technology has made a number of improvements to its courses as a result of unit evaluation feedback. Some of these include systematic analysis and planning of unit improvements, and consistent assignment return guidelines.

Monquest Teaching Evaluation surveys may be used by some of your academic staff this semester. They are administered by the Centre for Higher Education Quality (CHEQ) and may be completed in class with a facilitator or on-line through the my.monash portal. The data provided to lecturers is completely anonymous. Monquest surveys provide academic staff with evidence of the effectiveness of their teaching and identify areas for improvement. Individual Monquest reports are confidential, however, you can see the summary results of Monquest evaluations for 2006 at <http://www.adm.monash.edu.au/cheq/evaluations/monquest/profiles/index.html>

## Unit staff - contact details

### Unit leader

**Dr Raymond Smith**

Lecturer

Phone +61 3 990 26462

### **Lecturer(s) :**

**Dr Raymond Smith**

Lecturer

Phone +61 3 990 26462

Contact hours : Email for an appointment

### **Tutor(s) :**

**Dr Raymond Smith**

Lecturer

Phone +61 3 990 26462

### **Additional communication information**

All communication of a personal nature should be directed by email to the responsible lecturer at your campus. All general queries should be posted to the appropriate discussion forum so all students can participate in the discussion and be aware of the any outcome of these discussions.

## Teaching and learning method

This unit requires a fair amount of reading, both from the textbook Pressman and also the lecture slides. The unit covers much territory you will be familiar with in isolation but attempts to bring it together as a coherent knowledge base to describe the methods used in the development of large software engineering projects. The tutorial questions available from the MUSO site are there for you to judge how well you understand the concepts. If you find you are struggling with these please do some further reading and if still in doubt ask via the discussion forums.

## Communication, participation and feedback

Monash aims to provide a learning environment in which students receive a range of ongoing feedback throughout their studies. You will receive feedback on your work and progress in this unit. This may take the form of group feedback, individual feedback, peer feedback, self-comparison, verbal and written feedback, discussions (on line and in class) as well as more formal feedback related to assignment marks and grades. You are encouraged to draw on a variety of feedback to enhance your learning.

It is essential that you take action immediately if you realise that you have a problem that is affecting your study. Semesters are short, so we can help you best if you let us know as soon as problems arise. Regardless of whether the problem is related directly to your progress in the unit, if it is likely to interfere with your progress you should discuss it with your lecturer or a Community Service counsellor as soon as possible.

## Unit Schedule

Week	Topic	Study guide	References/Readings	Key dates
1	Introduction, Process models, metrics, requirements specifications	1	Pressman Ch 1, 3, 14.4, 15, 22	
2	Interface analysis and design	2	Pressman Ch 12	
3	Real-time Specification	3	Pressman Ch 7.1-7.4, 8.2-8.7	
4	Formal methods introduction	3	Pressman Ch 28	Ass 1 due 7/8/08
5	Formal specification - Z	3	Pressman Ch 28	
6	System and Software Design	4	Pressman Ch 9, 10.1-10.5, 11.1-11.2	
7	Project and risk management	5	Pressman Ch 21, 25	
8	Software Estimation	5	Pressman Ch 23	
9	Component-based development, Cleanroom Software Engineering	6	Pressman Ch 29,30	Ass 2 due 10/9/08



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10	Software Testing and Strategies	7	Pressman Ch 13, 14	
11	Software configuration maintenance	8	Pressman 27	
Mid semester break				
12	Software re-engineering	8	Pressman Ch 31	Ass 3 due 8/10/08

## Unit Resources

### Prescribed text(s) and readings

Pressman R.S., Software Engineering: A Practitioners Approach, Sixth Edition, McGraw-Hill, 2005. ISBN 007-123840-9

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

Sommerville, Ian. Software Engineering, Eighth Edition, Addison-Wesley, 2007. ISBN 0-321-31379-8

Van Vliet Hans, Software Engineering: Principles and Practice, Second Edition, John Wiley and Sons, 2000. ISBN 0-497-97508-7

Pfleeger Shari Lawrence, Software Engineering Theory and Practice, Prentice-Hall, 1998. ISBN 0-13-081272-2

### Required software and/or hardware

You will need access to a word processor for assignment preparation. A special Z font is available from the MUSO site for development of the Z formal methods specification in assignment 2.

### Equipment and consumables required or provided

Students studying off-campus are required to have the minimum system configuration specified by the Faculty as a condition of accepting admission, and regular Internet access. 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. You will need to allocate up to 5 hours per week for use of a computer, including time for newsgroups/discussion groups.

### 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 tutorial or laboratory tasks and exercises with sample solutions provided one to two weeks later;
- 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 MUSO, where resources outlined above will be made available.

### Library access

The Monash University Library site contains details about borrowing rights and catalogue searching. To learn more about the library and the various resources available, please go to <http://www.lib.monash.edu.au>. Be sure to obtain

a copy of the Library Guide, and if necessary, the instructions for remote access from the library website.

## Monash University Studies Online (MUSO)

All unit and lecture materials are available through MUSO (Monash University Studies Online). Blackboard is the primary application used to deliver your unit resources. Some units will be piloted in Moodle. If your unit is piloted in Moodle, you will see a link from your Blackboard unit to Moodle (<http://moodle.monash.edu.au>) and can bookmark this link to access directly. In Moodle, from the Faculty of Information Technology category, click on the link for your unit.

You can access MUSO and Blackboard via the portal: <http://my.monash.edu.au>

Click on the Study and enrolment tab, then Blackboard under the MUSO learning systems.

In order for your Blackboard unit(s) to function correctly, your computer needs to be correctly configured.

For example:

- Blackboard supported browser
- Supported Java runtime environment

For more information, please visit: <http://www.monash.edu.au/muso/support/students/downloadables-student.html>

**You can contact the MUSO Support by: Phone: (+61 3) 9903 1268**

For further contact information including operational hours, please visit:

<http://www.monash.edu.au/muso/support/students/contact.html>

Further information can be obtained from the MUSO support site:

<http://www.monash.edu.au/muso/support/index.html>

## Assessment

### Unit assessment policy

The unit is assessed with three assignments and a three hour closed book examination. To pass the unit, a student must obtain:

- attempt all assignments and the examination and
- 40% or more in the unit's examination and
- 40% or more in the unit's 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 assessment then a mark of no greater than 44-N will be recorded for the unit.

### Assignment tasks

- **Assignment Task**

**Title :** Requirements specification

**Description :**

**Weighting :** 15%

**Criteria for assessment :**

The full specification and criteria for all assignments will be available early in the semester from the MUSO Blackboard site

**Due date :** 7 August 2008

- **Assignment Task**

**Title :** Formal Specification - Z

**Description :**

**Weighting :** 15%

**Criteria for assessment :**

**Due date :** 10 September 2008

- **Assignment Task**

**Title :** Real-time specification

**Description :**

**Weighting :** 15%

**Criteria for assessment :**

**Due date :** 8 October 2008

## Examinations

- **Examination**

**Weighting** : 60%

**Length** : 3 hours

**Type ( open/closed book )** : Closed book

## Assignment submission

Assignments will be submitted by **electronic** submission to **Webface** for all Gippsland students. Students at Malaysia and South Africa will be informed by their local lecturer of the appropriate submission procedures. The due date is the date by which the submission must be received in Webface or alternative.

## Assignment coversheets

Assignment coversheets can be found :

- via the "Student assignment coversheets" ( <http://infotech.monash.edu.au/resources/student/assignments/>) page on the faculty website

## University and Faculty policy on assessment

### Due dates and extensions

The due dates for the submission of assignments are given in the previous section. 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 seldom regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

Requests for extensions must be made via email to the unit lecturer at least two days before the due date. You will be asked to forward original medical certificates in cases of illness, and may be asked to provide other forms of documentation where necessary.

### Late assignment

Assignments received after the due date will be subject to a penalty of **5% per day or part thereof**. Assignments received later than one week after the due date will not normally be accepted.

### Return dates

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

Assessment for the unit as a whole is in accordance with the provisions of the Monash University Education Policy at <http://www.policy.monash.edu/policy-bank/academic/education/assessment/>

We will aim to have assignment results made available to you within two weeks after assignment receipt.

### Plagiarism, cheating and collusion

Plagiarism and cheating are regarded as very serious offences. In cases where cheating has been confirmed, students have been severely penalised, from losing all marks for an assignment, to facing disciplinary action at the Faculty level. While we would wish that all our students adhere to sound ethical conduct and honesty, I will ask you to acquaint yourself with Student Rights and Responsibilities (<http://www.infotech.monash.edu.au/about/committees-groups/facboard/policies/studrights.html>) and the Faculty regulations that apply to students detected cheating as these will be applied in all detected cases.

In this University, cheating means seeking to obtain an unfair advantage in any examination or any other written or practical work to be submitted or completed by a student for assessment. It includes the use, or attempted use, of any means to gain an unfair advantage for any assessable work in the unit, where the means is contrary to the instructions for such work.

When you submit an individual assessment item, such as a program, a report, an essay, assignment or other piece of work, under your name you are understood to be stating that this is your own work. If a submission is identical with, or similar to, someone else's work, an assumption of cheating may arise. If you are planning on working with another student, it is acceptable to undertake research together, and discuss problems, but it is not acceptable to jointly develop or share solutions unless this is specified by your lecturer.

Intentionally providing students with your solutions to assignments is classified as "assisting to cheat" and students who do this may be subject to disciplinary action. You should take reasonable care that your solution is not accidentally or deliberately obtained by other students. For example, do not leave copies of your work in progress

on the hard drives of shared computers, and do not show your work to other students. If you believe this may have happened, please be sure to contact your lecturer as soon as possible.

Cheating also includes taking into an examination any material contrary to the regulations, including any bilingual dictionary, whether or not with the intention of using it to obtain an advantage.

Plagiarism involves the false representation of another person's ideas, or findings, as your own by either copying material or paraphrasing without citing sources. It is both professional and ethical to reference clearly the ideas and information that you have used from another writer. If the source is not identified, then you have plagiarised work of the other author. Plagiarism is a form of dishonesty that is insulting to the reader and grossly unfair to your student colleagues.

## **Register of counselling about plagiarism**

The university requires faculties to keep a simple and confidential register to record counselling to students about plagiarism (e.g. warnings). The register is accessible to Associate Deans Teaching (or nominees) and, where requested, students concerned have access to their own details in the register. The register is to serve as a record of counselling about the nature of plagiarism, not as a record of allegations; and no provision of appeals in relation to the register is necessary or applicable.

## **Non-discriminatory language**

The Faculty of Information Technology is committed to the use of non-discriminatory language in all forms of communication. Discriminatory language is that which refers in abusive terms to gender, race, age, sexual orientation, citizenship or nationality, ethnic or language background, physical or mental ability, or political or religious views, or which stereotypes groups in an adverse manner. This is not meant to preclude or inhibit legitimate academic debate on any issue; however, the language used in such debate should be non-discriminatory and sensitive to these matters. It is important to avoid the use of discriminatory language in your communications and written work. The most common form of discriminatory language in academic work tends to be in the area of gender inclusiveness. You are, therefore, requested to check for this and to ensure your work and communications are non-discriminatory in all respects.

## **Students with disabilities**

Students with disabilities that may disadvantage them in assessment should seek advice from one of the following before completing assessment tasks and examinations:

- Faculty of Information Technology Student Service staff, and / or
- your Unit Coordinator, or
- [Disabilities Liaison Unit](#)

## **Deferred assessment and special consideration**

Deferred assessment (not to be confused with an extension for submission of an assignment) may be granted in cases of extenuating personal circumstances such as serious personal illness or bereavement. Information and forms for Special Consideration and deferred assessment applications are available at <http://www.monash.edu.au/exams/special-consideration.html>. Contact the Faculty's Student Services staff at your campus for further information and advice.