

# MONASH UNIVERSITY

## School of Computer Science and Software Engineering CSE3308 Software Engineering: Analysis and Design

### Unit Information

**Semester 1 – 2005**

**Lecturer – David Squire**

#### Handbook entry

<http://www.monash.edu.au/pubs/2005handbooks/units/CSE3308.html>

#### Prerequisite knowledge

Completion of [CSE2305](#) Object-Oriented Software Engineering, or CSC2050

#### Prescribed Texts

There is no prescribed text for this unit.

### Objectives

On successful completion of this unit, the student should have:

- Knowledge of the difficulties of specifying and producing large software products, leading to
  - an appreciation of the need for software engineering methodologies
  - understanding of the distinction between software engineering and programming, and thus the distinction between a software configuration and a program
- An understanding of, and ability to apply, the methods of analysis and design, including:
  - structured analysis and design using Yourdon notation
    - Context Diagram, Event Lists, Data-Flow Diagrams, Entity-Relationship Diagram, State Transition Diagrams, Process Specifications, Data Dictionary, Structure Chart
  - object-oriented analysis and design using UML
    - Use Cases, Class Diagrams, Interaction Diagrams, State Diagrams, Package Diagrams, Activity Diagrams
- Knowledge of the problems of managing large software development projects, and the techniques used to address them, including
  - Configuration management
  - Software metrics
  - Validation and verification techniques
  - Quality management
  - Knowledge of , and the ability to apply, principles of user interface design such as affordances, awareness of mental models, visibility, mapping and feedback.

## Recommended Reading

No one book covers all the material required for unit. The following books cover the core material. Copies have been placed on reserve in the library.

One or both of { Yourdon, E., **Modern Structured Analysis**, 1989  
Hargrave-Andrew 004.21 Y81M, Caulfield 004.21 YOU  
Page-Jones, Meilir, **The Practical Guide to Structured Systems Design**, 1988  
Hargrave-Andrew 004.21 P133P2, Caulfield 004.21 PAG 1:2

One or both of { Booch; Rumbaugh; Jacobson, **The Unified Modeling Language User Guide**, 1998  
Hargrave-Andrew 005.12 B724U, Caulfield 005.12 BOO  
Page-Jones, Meilir, **Fundamentals of Object-Oriented Design in UML**, 2000  
Hargrave-Andrew 005.117 P133F

Pressman, Roger, **Software Engineering: A Practitioner's Approach**, 2000  
(4<sup>th</sup> or 5<sup>th</sup> edition); Hargrave-Andrew 005.1 P935S, Caulfield 005.1 P935S

Norman, Donald, **The Design of Everyday Things**, 1998; Hargrave-Andrew 620.82 N842D, Caulfield 620.82 NOR

Gamma et al., **Design Patterns**, 1995; Hargrave-Andrew 005.12 G193D, Caulfield 005.12 DES

The following books cover many of the important issues in the unit. The perusal of at least some of these books could be helpful in achieving a good mark:

Fowler, Martin: **UML Distilled** 1997 or 2000; Hargrave-Andrew 005.12 F787U, Caulfield 005.12 F787U

Fowler, Martin: **Analysis Patterns: reusable object models** 1997; Hargrave-Andrew 005.12 F787A, Caulfield 005.12 FOW

Martin, Robert C.: **Agile Software Development, Principles, Patterns, and Practices** 2002  
Caulfield 005.1 M382A

Meyer, Bertrand: **Object-Oriented Software Construction** (2<sup>nd</sup> Edition) 1997  
Hargrave-Andrew 005.1 M612.O, Caulfield 005.1 MEY 1:2

Sommerville, Ian: **Software Engineering** (5<sup>th</sup> Edition) (1996)  
Hargrave-Andrew 005.1 S69S5, Caulfield 005.1 SOM 1:5

## Computing and Laboratory Requirements for the Unit

Although no software packages are required for this unit, the use of Rational Rose or the open-source model drawing package Dia is likely to be of assistance in completing the analysis and design assignment. The use of other UML packages or drawing tools is also permitted. You should check the Resources page at the unit web site for links to suggested tools.

## Unit structure and organization

### Lectures

The lectures will be held in lecture room S6 at 3:00pm on Wednesdays and in lecture room R4 at 3:00pm on Thursdays.

## Schedule

Week	Date (Monday)	Lecture 1	Lecture 2	Assignment
1	28/2/2005	Introduction, Software Products and Processes Software Development Processes		
2	7/3/2005	Interface Design	Interface Design	Assignment 1 handed out
3	14/3/2005	Project and Configuration Management	What is Analysis and Design?	
4	21/3/2005	Structured Analysis	Structured Analysis	Assignment 2 handed out
Mid-Semester Break	28/3/2005	No lecture	No lecture	
5	4/4/2005	Structured Design	Structured Design	Assignment 2 Groups decided
6	11/4/2005	OO Analysis and Design	OO Analysis and Design	Assignment 1 due 13/4/2004
7	18/4/2005	OO Analysis and Design	OO Analysis and Design	
8	25/4/2005	OO Analysis and Design / Design Patterns	Design Patterns	Assignment 2 Progress report due 27/4/2004
9	2/5/2005	Risk	Reliability	
10	9/5/2005	Validation and Verification	Software Metrics	
11	16/5/2005	Software Quality	Software Development in Industry*	
12	23/5/2005	To be announced	Software Development in Industry*	Assignment 2 due 23/5/2004 Practice exam handed out
13	30/5/2005	Revision	Revision	
14	6/6/2005	Exam period commences		

\* Lecture given by industry representative

Note: This schedule is provisional. Check the unit web site for any modifications to the schedule.

## Practice Classes

There will be two practice classes each week, on Wednesday from 9.00am to 11:00am in EH2, and on Friday from 12:00 noon to 2:00pm in EH3. Students are not expected to attend more than one practice class per week. During a practice class, students are expected to work on practice problems and/or activities, which will be distributed via the unit web site, or on their assignments.

The lecturer and tutors will be available to comment on, and help with, solutions during the practice class. The practice class provides an ideal opportunity to discuss problems with the lecturer and/or tutors.

## Study Materials

All lectures slides will be available from the unit web site in a variety of formats, including Microsoft PowerPoint and PDF. You should note that copies of the slides are **not** "lecture notes". Notes are what **you** write during the lecture.

Assignment specifications will be handed out in lectures, and also made available from the unit web site. A sample exam, followed by sample solutions, will be handed out and made available from the unit web site.

Worksheets will be provided for use during some practice classes.

## Assessment

Both assignments and a closed-book written exam will be used to assess whether you have achieved the objectives for this unit. The assessment will consist of:

- Assignment 1, worth 15% due 13 April 2005, Individual Assignment on Interface Design
- Assignment 2, worth 45% due 23 May 2005, Group Project on Software Analysis and Design
- Three hour examination worth 40% of the marks, held during in the examination period at the end of the semester

### Submission of Assignments

Students are required to submit their assignment by **12 NOON** on the due date, in the submission box outside the CSSE office. Shortly thereafter, the submission box will be emptied and sealed. Late assignments must be handed directly to staff in the Enquiries Office, where they will be stamped with the date and time received. Late submissions will be penalised at the following rate:

- Submission on the due date but after 12 noon: -10%
- Submission the day after the due date -20%
- Submission two days after the due date: -40%
- Submission three or more days after the due date will not be accepted.

If you believe that your assignment will be delayed because of circumstances beyond your control such as illness you should apply for an extension **before** the due date. Medical certificates or certification supporting your application may be required.

### Group Assignment: extensions

Extensions will **not** be given for group assignments. Given the size of the groups, the illness of an individual student will not be accepted as a reason for an extension. Part of your project management strategy must be to plan for such contingencies.

## Group Assignment: differing contributions

All members of the group will rate the contribution of all other members of the group and these ratings will modify the mark that each individual receives, but not by more than 20%.

If a group is having trouble with an individual member and your efforts to resolve the issue have been fruitless, then the group **must** approach the lecturer to assist in resolving the problem **as soon as it arises**. A claim that a student did not contribute his or her fair share will **not be considered** if it is made just prior to the submission of the assignment, or after submission.

## Passing the Unit

You need to achieve 50% in both the exam **and** the assignments to pass this unit and achieve an overall mark of 50%, i.e.

- You must get at least 20 marks out of 40 for the exam
- You must get 30 marks out of 60 for the assignments
- You must get 50 marks out of 100 overall

All lecture materials, worksheets and assignment work are examinable.

## Plagiarism and Cheating

It is important that your solutions to the assignment questions be your own work. It is perfectly acceptable to seek help and advice when completing the assignments, but this must not be taken to the point where what is submitted is in part someone else's work. This applies to both the individual and group assignments: an individual assignment must be the work of that individual, and a group assignment must be the work of that group.

Please note that, since the assignments are used in assessing your final grade in this unit, the Faculty policy on Cheating applies. In addition, the following School policy applies:

"The assignments set in this unit are designed primarily as learning exercises, but they also contribute to your final grade. Copying of other student's assignment solutions is unacceptable.

All students have a responsibility to ensure that their assignment solutions are their own work. You must ensure that others do not obtain access to your solutions for the purpose of copying a part of them. Where such plagiarism is detected, both of the assignments involved will receive no marks.

In significant cases of plagiarism, action may be taken against the offenders under the University's disciplinary regulations."

Students should consult University materials on cheating, in particular:

- Statute 4.1 on Discipline at <http://www.monash.edu.au/pubs/calendar/statutes/statutes04.html> - [Heading102](#).
- Student Resource Guide at <http://www.monash.edu.au/pubs/handbooks/srg/>, particularly the sections on
  - Plagiarism/Cheating at <http://www.monash.edu.au/pubs/handbooks/srg/srg0073.htm>.
  - Student Rights and Responsibilities at <http://www.monash.edu.au/pubs/handbooks/srg/srg0059.htm>.
- Faculty policy at <http://www.infotech.monash.edu.au/facboard/policies/academiccheat.html>.

It is the student's responsibility to make themselves familiar with the contents of these documents.

## Computing Resources

You need to be aware that the computing resources that may be supplied to you in order to undertake this unit cost real money, and the university has had to impose limits on the use of the internet for all staff and students. A quota system is to be introduced this year, but in the meantime you must make yourself aware of the "Acceptable Use" policies of both the faculty and the university. These can be accessed on the web at

[http://www.infotech.monash.edu.au/myfit/students/student\\_labinfo\\_rules\\_netusage.cfm](http://www.infotech.monash.edu.au/myfit/students/student_labinfo_rules_netusage.cfm)

<http://www.adm.monash.edu.au/unisec/pol/itec12.html>

Note that accessing these and other course-related URLs from within Monash is free from within the Monash network, and is not regarded as part of quota.

## Staff

The lecturer in charge of the unit is:

Dr David Squire

Caulfield: Room B5.23A, Phone 9903 1033

Clayton: Room 134, Building 75 Phone 9905 8307

Email: [David.Squire@csse.monash.edu.au](mailto:David.Squire@csse.monash.edu.au)

All queries should be directed to me (David Squire). Since I work on both the Caulfield and Clayton campuses, it is advisable to use email to arrange a meeting if you wish to see me outside of specified consultation hours.

## Consultation times

The primary time for consultation is during the practice classes. Dr Squire will also be available for consultation in his Clayton office between 11:00am and 1:00pm on Thursdays. Preference will be given to students who make appointments. In time of high demand, preference will be given to students who did not have an appointment during the previous week.

## Web Site

The unit web site can be found at:

<http://www.csse.monash.edu.au/courseware/cse3308/>

Resources available from this site will include:

- Lectures Slides
- Worksheets
- Assignment specifications
- Links relevant to the unit
- Anonymous feedback forum – you are expected to check this regularly