



MONASH University

FIT2005
Systems analysis and design 2

Unit Guide

Semester 2, 2009

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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FIT2005 Systems analysis and design 2 - Semester 2, 2009

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Additional communication information:

Unless you have personal enquiries (see below) all communication related to the content of the unit must be via the online Discussion Forums. If you do send the lecturer an email that relates to the content of the unit it may not be answered, or you may be redirected to the forum.

Personal enquiries include requests for assignment extensions (where warranted by circumstances), special consideration requests, or the need to discuss your personal progress. You are certainly not asked to put anything of a personal nature into your forum postings. Personal matters can also be dealt with by telephone.

On-campus students, and off-campus students who live or work near a campus, may also visit the lecturer at their office.

Note: The staff may contact you during the semester, by sending an email to your @**student.monash.edu** address. You are therefore expected to either check that email regularly (at least twice a week), or have it redirect mail to an address which you are going to check regularly. Any email purporting to be from a student but which does not come from your Monash email address is allowed to be ignored by the staff member, as the sending of a reply to an address which is not actually yours could be a violation of the Privacy provisions of legislation.

Introduction

Welcome to FIT2005 Systems Analysis & Design 2 for semester 2, 2009. This 6 point unit is designed to let you learn the deeper aspects of software modeling and design using UML. The pre-requisite (FIT2001) introduced you to the concepts of analysis and design and provided some background to the concepts which we examine in more detail in this unit. There is also an emphasis on theoretical object-oriented design concepts. By the end of this unit you should be well prepared to design large and complex software systems (such as could be required for your final year software development project).

You are expected to have completed FIT2001, and hopefully you will have successfully completed FIT1002, otherwise you may find this a very difficult unit to understand.

Unit synopsis

This unit examines object-oriented systems modelling/design in greater depth than the prerequisite unit. The key disciplines of the Unified Process will be examined to set a context for analysis and design. Students will learn about static and dynamic modelling, and component-based design, using UML. Some common design patterns will be studied. Some topics about software architecture are examined.

The unit prepares students to be able to design large systems such as will be implemented in their final year project unit or after graduation.

Learning outcomes

On successful completion of this unit students will:

1. understand object-oriented concepts such as: association, aggregation and composition; polymorphism and generalisation; messaging and object interaction, state and lifespan of objects; encapsulation, connascence, domains, encumbrance, cohesion, coupling;
2. know the finer details of syntax and semantics of the Unified Modelling Language with respect to modelling class diagrams, interaction diagrams, state machine diagrams, package diagrams, activity diagrams, deployment diagrams, timing diagrams, interface and component diagrams;
3. be able to consider advanced topics in relation to use cases and specifications when analysing a system;
4. understand the role of software architecture, and be able to employ several common architectural such as tiered computing, client/server, pipes and filters, P2P, layered implementation, publisher/subscriber, to design systems;
5. understand the role of patterns and pattern languages in designing systems, and be familiar with a range of structural, creational and behavioral patterns;
6. be able to apply theoretical concepts and techniques for problem solving, to design complete software systems in a range of settings;
7. be able to justify system design decisions with reference to a model's quality, limitations, scope for future extension, and to theoretical concepts;
8. utilise IT practitioner tools to support the process and documentation of systems design.
9. be able to communicate the design of a system through electronic documents including UML models, other diagrams, and supporting text;
10. have an awareness of the process by which object-oriented system analysis and design is performed using a framework such as the Unified Process.

Contact hours

4 hrs/week

Workload

This is a 6 point unit. At Monash, this means that an average student is expected to spend approximately 12 hours per week, all semester, giving attention to this unit. If you do not spend that much time, you will probably not do so well in this unit as you otherwise might.

For **on campus students**, workload commitments are:

- a weekly two-hour lecture/workshop session, in which concepts will be presented or demonstrated
- a weekly two-hour tutorial session, in which you will be required to perform problem solving activities and discuss ideas relating to the topics studied. Note: You must have completed all readings set for that week *prior* to attending the class.
- a minimum of 2 hours of private/personal study in order to satisfy the reading and assignment expectations.

For **Off-campus students**: You generally do not attend lecture and tutorial sessions (but are allowed to if you are near a campus), however, you should plan to spend equivalent time working through the relevant resources and participating in discussion groups each week. Suggested times are listed at the front of each module of the unit study guide.

All students will need to allocate time each week (up to 5 hours per week in some weeks), for use of a computer, including time for reading online discussion forums, or doing assignment work (which can also be hand-drawn)

Note: Assignment tasks are designed to be relatively straightforward for people who have properly engaged in attempting the weekly readings and tutorial exercises.

All Students should familiarise themselves with the document "*Student Rights and Responsibilities (Information Technology)*" available at

<http://www.infotech.monash.edu.au/about/committees-groups/facboard/policies/studrights.html>

Unit relationships

Prerequisites

FIT2001 or equivalent

Co-requisites

FIT1002 or equivalent

Prohibitions

GCO2813, GCO2816, GCO9806

Relationships

FIT2005 is a core unit in the *Applications Development and Networks* major and *Business Systems* major of the **Bachelor of Information Technology and Systems** degree.

It is a prerequisite for FIT3047/FIT3048, and FIT3037.

You may not study this unit if you have already completed any of the following units: CSE2200, GCO2813, GCO2816, GCO9806, IMS2805.

Teaching and learning method

The curriculum is defined by what is covered in the Study Guide modules for each week. All students are expected to work through the study guide modules in preparation for that week's classes.

On campus students will have two classes per week: a lecture/workshop session and a tutorial session. The purpose of the first is to discuss the concepts of that week's curriculum and give examples - therefore you should have done the required reading beforehand. The purpose of the second is to give you an opportunity to apply the concepts by working on small problems, possibly in small groups, so that you can get formative feedback on your learning of the new concepts and skills.

Assignments are designed to be attempted *after* you have completed all required readings and practical exercises. They are also likely to be another source of learning, although their primary purpose is for staff to assess how well you have progressed in meeting the learning objectives of the unit.

Discussion forums are provided as a place where you may ask questions about the content of the unit. You should also use these to clarify the work required in your assignments. They are checked at least twice per week, and sometimes even more often than that.

Additionally, there may be some quizzes placed online which will allow you to self-test your understanding on some concepts. Announcements will be made when they become available. (These quizzes do not form part of the unit's assessment.)

Students should spend approximately 8 hours per week outside of class for personal study every week, including time spent reading, doing exercises, working on assignments and reading the discussion forums.

Timetable information

For information on timetabling for on-campus classes please refer to MUTTS, <http://mutts.monash.edu.au/MUTTS/>

Tutorial allocation

On-campus students should register for tutorials/laboratories using the Allocate+ system:
<http://allocate.cc.monash.edu.au/>

Off-Campus Learning or flexible delivery

Students in Singapore may be able to attend classes at TMC; the purpose of these classes is to discuss the tutorial exercises, it is not meant to be a "lecture".

All off-campus students (including Singapore students) are expected to attempt the weekly exercises. You can share your attempts online, and if you have queries about the attempts post these to the discussion forum.

Unit Schedule

Week	Topic	Study guide	Key dates
1	Introducing UML and UP	Module 1	
2	Use Case Modeling	Module 2	
3	Analysis: Static Modeling	Module 3	
4	Analysis: Use Case Realisation	Module 4	

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5	Inheritance and Polymorphism	Module 5	17/8 - Assignment 1 due
6	Designing Classes	Module 6	
7	States and State Machine Diagrams	Module 7	
8	Patterns	Module 8	
9	Designing Components	Module 9	14/9 - Assignment 2 due
10	Archetypes & Archetype Patterns	Module 10	
Mid semester break			
11	Software Architecture	Module 11	
12	Further Topics TBA (assessable)	Module 12	18/10 - Assignment 3 due
13	Review	All Modules	

Unit Resources

Prescribed text(s) and readings

Prescribed textbook (compulsory to have this book)

Arlow, J. & Neustadt, I. (2005), *UML 2 and the Unified Process*, 2nd ed., Addison Wesley Professional, 2005. ISBN: 0321321278

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 or order your text book early.

Recommended text(s) and readings

The following are other books which may be helpful. Some of these are listed in the Study Guide.

Rumbaugh, J., Jacobson, I. & Booch, G., *The Unified Modeling Language Reference Manual*, 2nd ed., Addison Wesley Professional, 2005. ISBN: 0321245628

Page-Jones, M., *Fundamentals of Object-Oriented Design in UML*, Addison Wesley, 2000. ISBN: 20169946X

Blaha, M. & Rumbaugh, J., *Object-Oriented Modeling and Design with UML*, 2nd ed., Prentice-Hall, 2005. ISBN: 0131968599

Deacon, J. *Object-Oriented Analysis and Design*, Addison-Wesley, 2005. ISBN: 0321263170

Booch, G., Rumbaugh, J. & Jacobson, I., *The Unified Modeling Language User Guide*, 2nd ed., Addison Wesley Professional, 2005. ISBN: 0321267974

Required software and/or hardware

You are not **required** to have software for this unit, but we suggest that you may want to use *Visual Paradigm 3.4* for which Monash has an academic licence.

Staff will provide assistance only for the above-mentioned software. Off-Campus students have been sent a CD-ROM containing the software. On-campus students have access to the software in the lab rooms, and are able to get a CD-ROM from staff to install it on their personal machines - there is **no need for you to download** the very large installation file.

Assignment work can be either hand-written or produced by software, the only important aspect is that it is legible to the marker.

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, in order to maintain communication with the staff.

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.

Study resources

Study resources we will provide for your study are:

- The **Unit Book**, consisting of 12 study guides (one per week of the semester) - found online
- A printed **Reader** containing additional compulsory reading material which supplements material covered by the prescribed textbook.
- Weekly tutorial exercises, and sample solutions which are provided several weeks later.
- Assignment specifications, and sample solutions.
- Online Discussion Forums
- This Unit Guide outlining the administrative information for the unit.
- The unit web site on Moodle, where resources outlined above will be made available
- Recordings (in MP3 format) of the workshop sessions from the Gippsland campus.
- Access to a sample exam paper (but not solutions)

Assessment

Overview

Examination (3 hours): 50%; Assignments: 50%

Faculty assessment policy

To pass a unit which includes an examination as part of the assessment a student must obtain:

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

Assignment tasks

Assignment coversheets

Assignment coversheets are available via "Student Forms" on the Faculty website:

<http://www.infotech.monash.edu.au/resources/student/forms/>

You MUST submit a completed coversheet with all assignments, ensuring that the plagiarism declaration section is signed.

Assignment submission and return procedures, and assessment criteria will be specified with each assignment.

• Assignment task 1

Title:

Assignment 1

Description:

Tasks which assess your ability to consider a business scenario to identify the requirements of a system, and to develop use cases and an initial class model of the business operational setting.

Focuses on objectives arising primarily from modules 2 and 3.

Weighting:

16%

Due date:

17 August (Week 5)

• Assignment task 2

Title:

Assignment 2

Description:

A set of exercises which enables assessment of your progress in attaining skills and understanding as presented in study guides 4 through 7.

Weighting:

17%

Due date:

14 September (Week 9)

• Assignment task 3

Title:

Assignment 3

Description:

A major task in designing a system. You will be given an already-done analysis for a case study, and be asked to demonstrate your ability to perform key activities of the design workflow and to apply concepts, arising from what is presented in study guides 4 through 10.

Weighting:

17%

Due date:

18 October (Week 12)

Examination

- **Weighting:** 50%

Length: 3 hours

Type (open/closed book): Closed book

See Appendix for End of semester special consideration / deferred exams process.

Due dates and extensions

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 not regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

Students requesting an extension for any assessment during semester (eg. Assignments, tests or presentations) are required to submit a Special Consideration application form (in-semester exam/assessment task), along with original copies of supporting documentation, directly to their lecturer within two working days before the assessment submission deadline. Lecturers will provide specific outcomes directly to students via email within 2 working days. The lecturer reserves the right to refuse late applications.

A copy of the email or other written communication of an extension must be attached to the assignment submission.

Refer to the Faculty Special consideration webpage or further details and to access application forms:
<http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>

Late assignment

Assignments received after the due date will be subject to a penalty of a drop in grade compared to what the work is worth. Assignments sent after the cutoff date (usually 1 week later than the due date) will receive no more than 10% for that work.

This policy is strict because comments or guidance will be given on assignments as they are returned, and sample solutions and comments may also be published and distributed, either after assignment marking or with the returned assignment.

Return dates

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

Appendix

Please visit the following URL: <http://www.infotech.monash.edu.au/units/appendix.html> for further information about:

- Continuous improvement
- Unit evaluations
- Communication, participation and feedback
- Library access
- Monash University Studies Online (MUSO)
- Plagiarism, cheating and collusion
- Register of counselling about plagiarism
- Non-discriminatory language
- Students with disability
- End of semester special consideration / deferred exams