Student assessment Guide

Introduction to Systems Modelling

Robin Beaumont, 08th April 2009

1. Introduction

This unit, contains six assessments:

1. Posting of at least **10** appropriate messages on the forum/discussion board.
2. UML Use Case diagram along with your interpretation (constraints, interpretation of ambiguities, enhancements etc) of the specified scenario (see forum/discussion board for details)
3. Class diagram (CD) for the specified scenario along with your interpretation (constraints, interpretation of ambiguities, enhancements etc) of the specified scenario (see forum/discussion board for details)
4. Sequence diagram (instance based) for the specified scenario along with your interpretation (constraints, interpretation of ambiguities, enhancements etc) of the specified scenario (see forum/discussion board for details)
5. State diagram for one of the Classes identified in the Class diagram along with your interpretation (constraints, interpretation of ambiguities, enhancements etc) of the specified scenario (see forum/discussion board for details)
6. A timed online Multiple Choice Question (MCQ) exam (you can take this only once via the Edinburgh Learning Management system).

To pass this part of the course you must obtain more than 40% in each of the above assignments.

Items 2, 3, 4 and 5 should be submitted as a single word document, containing the various diagrams and narrative. This also applies to any Drafts you submit

Assessment Component	Weighting toward final mark	Pass mark
MCQ	0	40%
Postings	0	40%
Use case Diagram	10%	40%
Class Diagram	30%	40%
Sequence Diagram	30%	40%
State Diagram	30%	40%

2. MCQs

All the questions that you will be presented with in the formal assessment are from those contained within the course material. Your MCQ exam score will not count towards your final mark for the course, but you must pass the exam (i.e. obtain 40% or more) in order to pass the course.

3. Assessed use of the course forum/discussion board

Post at least 10 appropriate messages on the course forum/discussion board. This score will not count towards your final mark for the course, but you must pass this component (i.e. obtain more than 40%) in order to pass the entire course.

1.1 How Do I Mark This Component?

	Component	Description
1	Number of messages	Less than required number (fail), required number or more (pass)
2	Length	Excessively long – over approximately 40 lines (fail) Length appropriate *(Random sample taken from postings)* (pass)
3	Content	Irrelevant or demonstrates mis-information (fail). Relevant to unit material (pass) *(Random sample taken from postings)*
4	Style	Inappropriately formal / abusive (fail). Appropriate to encourage discussion board interaction (pass)

I think that I need to clarify two of the above criteria.

Content - by irrelevant I mean discussions of meeting for a beer or offering a recipe. Please do use the discussion board to try and help you to understand concepts you are having problems with. Demonstrating lack of understanding is different from 'mis-information', which is a deliberate attempt to give incorrect information. If at the end of the unit you have posted the required number of messages with appropriate content obviously there is no harm in having posted additional 'social chit chat' messages, the problem arises when all your messages are of this type.

Style – Here I may be accused of being racist, as some cultures present much more formal faces than others. However I'm attempting to prevent postings that prevent / kill discussions. It is always a good idea to end a discussion board posting with a question.

It is highly unlikely that anyone will fail this component.

4. How do I mark the UML diagrams and Accompanying Narrative

For each diagram I consider:

Component	Marks	Description
1. element type 1	0	No appropriate elements defined
	1 – 4	Less than 30% of appropriate elements defined using UML2.0 semantics
	5 – 6	31 – 80% of appropriate elements defined using the complete range of UML2.0 semantics
	7 – 10	>81% of appropriate elements defined using the complete range of UML2.0 semantics, parsimonious/ original solution.
2. element type 2	0	No appropriate elements defined
	1 – 4	Less than 30% of appropriate elements defined using UML2.0 semantics
	5 – 6	31 – 80% of appropriate elements defined using the complete range of UML2.0 semantics
	7 – 10	>81% of appropriate elements defined using UML2.0 semantics, parsimonious/ original solution.
3. Compatibility with other diagrams	0	No compatibility with other diagrams
	1 – 4	Less than 30% compatibility with other diagrams
	5 – 6	31 – 80% compatibility with other diagrams
	7 – 10	>81% compatibility with other diagrams.
4. Interpretation: assumptions, ambiguities, constraints and enhancements	0	No reasoning
	1 – 4	Vague / some descriptions not appropriate to UML diagram and contradictory to the information provided
	5 – 6	Most descriptions appropriate to chosen UML diagram and derived from the information provided
	7 – 10	Descriptions appropriate to chosen UML diagram and derived from the information provided. Clear appropriate, parsimonious descriptions of constraints and questions raised by lack of information provided in certain areas. Originality in solution.

Each element is different for each UML diagram, for example for the Class diagram element 1 might be classes, and element 2, associations. Alternatively for the Sequence diagram the two elements would be lifelines, and messages.

How long should the interpretation be?
Usually one to two pages for each diagram is sufficient.

5. How do I produce the diagrams?

Use either MagicDraw or Visual Paradigm, the unit material describes fully how to cut and paste diagrams into a word document.

6. Some hints as to how to produce the Class diagram

You can adopt several strategies; one is to use the Use Case diagram as the basis. Another is to follow the method described in the material in the unit about ERD diagrams of which a brief resume of the technique is given below, alternatively you can adopt a mixed approach using both methods as well as iterating between diagrams. For example often once you have specified a particular sequence diagram scenario you realise you have added instances of classes that do not exit in the class diagram and therefore need to amend it appropriately.

Resume of Rumbaugh's method for identifying classes

Identification of possible Classes by searching for nouns in any narrative descriptions. In the specified scenario you may also be given sample reports and a list of fields to help you. If you have been do look at the reports as they provide additional clues to the scenario. All the scenarios contain deliberate omissions so that you can list assumptions / constraints you have needed to make to produce the model.

1. Selection/ standardisation of Classes by applying various rules/criteria such as:
    a. changing all names to singular nouns (e.g PATIENT instead of PATIENTS)
    b. removing synonyms / homonyms
    c. etc. (see unit material)
2. Consider relationships
3. Refine / review
   This frequently involves removing redundancy and re-arranging.

Good class diagrams frequently only have one or two relationships between most Classes, although an important entity often has more. Do remember that you can walk through several relationships. For example GP ->PATIENT -> CONSULTATION -> TEST means that you could find out all about what TESTs a particular GP ordered, you do not need an extra relationship GP->TEST to do this.

Concerning re-arranging Classes remember that a relationship is often a dependency, that is in a one to many relationship you must have something at the ‘one’ end before you can at the other end.

Throughout the entire process described above you MUST document any assumptions and / or restrictions you have modelled. For example in the DopeHead scenario there are many ambiguities so I would explicitly state that:

- An athlete can have one or more trainers. (you might decide to state that an athlete can only have one trainer – which is fine if it does not contradict the information provided in the scenario or the Class diagram).
- Similarly a trainer may train one or more athletes. Although this was not stated in the scenario it seems entirely reasonable to say this but the important thing is that it must be stated that you have decided to interpret it in this manner.

7. Some hints as to how to produce the Sequence Diagram

The particular type of Sequence diagram I want you to produce is for a specific **instance** scenario from the narrative description provided, it will be only one of many possible ones.

The narrative and names at the top of the lifelines should match. For example you may begin the description with something like

- Miss jones (Instance of customer) receives a instance of mailing (message 1)
- Miss Jones contacts sarah (instance of Personal_Assistant) (message 2)
- Sarah updates the Mullarkey_event acceptance list (instance of mailing_class) (message 3)

Most of the messages should correspondent to, or be associated with methods in the class diagram.

Because the lifelines represent instances of classes the sequence diagram should:

- only contain instances of classes you have identified in the Class diagram.
- You might need to include more than one instance of a particular class in the sequence diagram, e.g. two customers etc.

8. Can I include Child/Occurrence Fragment diagrams?

You may feel that it is helpful, particularly in the Sequence diagram, to break the scenario up into more than one diagram using occurrence fragments which this is fine. I will just consider the group of sequences diagrams ('interaction occurrences') to be a single diagram for purposes of marking.

This is true for any of the diagram types.