

## **CS405 Introduction to Empirical Modelling**

### **Revision guidance for the examination 2005-06**

This document is based on a similar one for 2004-05 written by WMB. For the sake of reference to previous exam papers this year's version details the similarities and the differences of this year's module coverage from previous years.

As in previous years the first question is compulsory and then there is a choice of two from the remaining four questions.

You should be sure that you are familiar with the general principles and concepts of EM as they apply to the development of definitive scripts for the modelling of concurrent systems. So you should understand the the role played by observation, dependency and agency in agent-oriented analysis, and the development of interactive situation models using definitive scripts. You should review the way that LSD accounts refer to artefacts within the conceptual framework of the Abstract Definitive Machine This relates primarily to the first and second sections of the module (Lectures 2 – 11).

The above paragraph is my re-writing of a similar one last year from WMB. I did not refer often this year to 'interactive situation models' (ISMs), but it is in some of the publications so useful for you to know the term. It was introduced by Patrick Sun in his PhD thesis and emphasises that a model in EM usually begins as something 'situated' in a particular here-and-now context experienced by the modeller.

The compulsory Question 1 covers the basic conceptions and practicalities of EM that form the core of the module.

The material is relatively hard and there is little published material outside what is provided in the module or website. So we are giving guidance on the expected areas for optional questions.

Last year Meurig identified eight application areas which for the sake of the examination he grouped by pairs into four areas and indicated that these corresponded to appropriate 'targets for revision'; these were to be the 'main focus of the optional questions'. The four pairs were:

- (i) Concurrent engineering + Interactive Graphics and Design
- (ii) Human Computing + Artificial Intelligence
- (iii) Educational Technology + Human Computer Interaction
- (iv) Software Development + Concurrent Systems Modelling

You can see how this scheme corresponds to the 2005 examination.

This year we concentrated on only three application areas in the lectures being the first parts of the themes (ii), (iii) and (iv) above; these were the topics of Lectures 12, 13, 14 respectively. This year the fourth optional question will be on an aspect of the core material of EM. The small overlap of this question with the compulsory question can be ignored. One aspect of the module this year that was new, and did not appear in this form in previous years, was the attempt to offer an 'orientation' through thinking about

whether Computer science was really a 'science' in the traditional sense and the consideration of the difference between experiment that is 'pre-theory' and experiment that is 'post-theory'. Also the application areas were presented as a 're-orientation' on existing applications in computing.

So, as last year, to help in giving some focus to your revision of quite large application areas here are some keywords and phrases:

Human Computing (HC): broader goals than EM, technologies in support of HC, difficulties of HC and relation to HCI;

Educational and Learning: constructionism in sense of Papert, notion of 'active learning', extent to which EM supports constructionism;

Software Development/Approach to Computation: relationship of programming and modelling, perspectives on EM and CS, role of interaction in 'sense-making'.

Last year Meurig indicated three EM publications relating to each of the 8 application areas (this was really to help inform ideas for the coursework), and he wrote a short essay on each of the four 'paired' areas. Although these are therefore broader than the question topics this year they contain some useful guides to the topics and the papers referred to. So I have attached them here.

They certainly indicate a good way to get better 'in-depth' knowledge on the main three application areas this year.

Note that the essay on Software Development + Concurrent Systems Modelling refers to papers by Brian Cantwell-Smith and David Harel. This is very much in line with my association in the examination this year of the material on 'orientation' and foundations with software development. This is not to say it is the only place such material may occur.

It is not necessary this year to study in depth all three application areas. You should find that if you study two of them thoroughly, and you understand the core material well, you are in a reasonably comfortable position to choose the two optional questions.

I strongly recommend that you review the Labs in order to refresh your memory of the various practical aspects of the module. For example, the Agent-oriented parser, and the Dependency Modelling Tool were really only explained this year via the labs. In most cases these also inform the theoretical aspects of EM, and they may help you to refer to practical illustration where appropriate. You can also, of course, refer to your own coursework whenever you think it is appropriate.

SBR  
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