MScIP Project

FACP
July 2004

July 15, 2004

1 Details

All IP projects start with PPC (project preparation), with MSc students continuing with PRC, the MScIP project.

The MScIP is a conversion course for students with a good (second class or better) degree in a subject other than Computer Science. The project must conform to the M criteria of FHEQ, but might not achieve its novelty solely from its computer science contribution.

Acronym	Credit	Mark	Timing	Presentation
PPC	10	0	Su/1/M - Su/10/F	
PRC	50	350	Vac/1/M - Vac/11/F	Vac/12/W-Th

The project report carries 95% of the marks, and the presentation 5%.

2 PPC and MSc Confirmation

All MSc students select projects before Easter. Their MSc/Diploma status is determined in the Summer term. Thus, all students have an M-level project designated before MSc status is determined (at the External Examiners meeting in June).

The MSc project consumes a notional 600 hours' work, of which one to two hundred hours might be needed for writing up. MSc degrees have a formal 10-credit project preparation (PPC) in the Summer term, during which preparatory work is conducted, including literature review.

3 MScIP Project Learning Outcomes

On completion of an M-level project, the students should be able to do the following.

- Demonstrate that they have acquired specialisation in a particular part of the subject area, including enhanced or new technical skills that build on taught theory. Examined in the overall project report.

- Demonstrate that they have engaged in research and critical understanding of advanced scholarship in their chosen area. Examined in the project literature review and evaluation.

- Contribute in an original way to an established area of research or development, demonstrating a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge. Examined in the overall project report. The project report must present some original (and relevant) contribution. It may present a new approach to a known problem, or an existing approach applied to a new class of problems. It may present a new analysis or critique of well-known work. It may devise a new method, or extend an existing method into new areas. The student should be able to clearly identify what is new and to evaluate the contribution made.

  - MScIP students may be concerned about their ability to achieve novelty after only one year's exposure to CS. Some novelty may be achieved by the application of an aspect of computer science or engineering to a problem from their previous discipline or employment. The student should be able to clearly identify what is new (in the computer science context) and to evaluate the contribution made.

- Formulate a moderate sized problem, to select and justify an appropriate approach, and to follow the approach systematically. Examined in the design/implementation chapters of the project.

- Recognise alternatives, selecting and justifying the approach taken at each point in the report, identifying parts of the project area that are feasible within the time (etc) constraints of the project. Examined in the design/implementation chapters of the project.

- Appreciate the latent issues of the subject area (for example, in software engineering they should have met and tackled issues such as emergent requirements, design flaws, equipment/application problems). Examined in the project design/implementation and evaluation chapters.

- Prepare a written report on the work done, according to the defined criteria, and of a standard that would be acceptable for wider publication. In particular, the student should be able to prepare a report the structure and presentation of which is uncontentious, and in which the referencing is of publishable academic standard. The report must demonstrate critical abilities and evaluation of work done and methods applied. Examined in the *presentation* aspect of the report mark.

- Make a short oral presentation (assessed) summarising their work and demonstrating the end product.

3.1 Characterisation of an MScIP project

The MScIP degree is accredited by the British Computer Society, which places some restrictions on the project.

MScIP projects may be characterised as *general/lifecycle* projects.

The term *lifecycle* is intended to reference the engineering concept of project progress; it is fundamental to the department's lifecycle projects that the lifecycle notion and associated engineering concepts can be applied outside the pure engineering domain – that is to say, a lifecycle project does not have to produce a computer system (hardware or software).

A pure lifecycle project uses the process components of requirements, design, and implementation to produce something; evaluation should include product testing. The basic characterisation is that represented in the Royce Waterfall model of systems development; it can be applied as imaginatively and creatively as necessary.

- Project reports must define what the project is about (requirements), specify the product or solution, proceed by reducing the abstraction or non-determinism of the specification, and then provide some evaluation of the extent to which the product or solution met its goals (ie requirements). Normally, a project should build or implement a product that can be evaluated for quality, reliability etc, as well.

- Project reports should include a clear statement of the method used to produce the product or solution (and justification of the method where appropriate). Even the many software projects that follow a simple waterfall model should state that this is what was done. Alternative example methods are: well-known systems development method such as prototyping approaches, spiral model, hardware development models; scientific method; other documentable development methods. It follows that a project that does not have a suitable method (eg literature review) is not suitable for these students.

- In adhering to the lifecycle characterisation, the project report needs to contain at least the following things (in addition or in parallel to the technical content on the product and its development):

  - a literature review, which uses existing material to set the scene and motivate the project and its carrying out;
  - rationale (justification) for paths followed and not followed, in general and at each relevant step and stage of the reported project;
  - evaluation (critical commentary) of the method used, the decisions taken, the outcome and the generality of the project approach.

A more general project is also marked against a "lifecycle" scheme – review, design, implementation, evaluation. The project report needs to achieve the same things as the lifecycle report, but could do so in different ways. The report

must present rationalisation (justification) and evaluation (critical commentary) on the approach, the work undertaken, the outcome and the generality of the project.

4 MSc IP Project Reports

In addition to the requirements placed on reports in the characterisation, above, all the department's Project reports must conform to academic standards.

- The report must clearly state its goals and the approach that it takes to meeting those goals.
- The report must be free of academic misconduct (ie collusion and plagiarism); it must include a bibliography that clearly relates to in-text citations; all sources must be explicitly referenced and identified in the text, however these are published/consulted.
- The report must be coherent, illustrating the development and the product or solution. Full design models, code and other technical material should be relegated to appendices.
- The report must follow the guidelines set out in the Students' Handbook of the academic year in which the project is started (available on line in that academic year).

Students should also be aware of the following advice from the BCS accreditation guidelines.

The product that is the goal of the project must exhibit the attributes of quality, reliability, timeliness and maintainability (BCS *CEng* requirements). These terms are elaborated as follows, for conventional projects that develop software or hardware, and for other forms of lifecycle project. Note that timeliness is split into timeliness within the project, and timeliness of the report.

Quality: the project report should identify, as part of the introduction, the quality criteria that apply to the product or solution; later, the way in which the product or solution meets these criteria (or not) should be clearly stated. For software/hardware products, both process verification and product validation are required. Quality must be built in to the project from the start; exceptionally (where the product is not in a testable state), the plans for validation must be clearly presented, and the last stage of design validated as appropriate. Note that the project report should display quality, in terms of presentation, structure, referencing, consistency etc.

Reliability: this is taken to be one element of quality, demonstrable by product validation; tests/validation plans should include elements that can demonstrate the reliability of the product or solution.

Timeliness (project): the essence of engineering timely solutions is to be able to determine the time required for development. For a project, the elapsed time is fixed; the need is to fit the development and implementation into this time, by scoping the project and, if needed, narrowing its goals. It is generally more appropriate to reach implementation for part of the specified solution, than to have a complete design but no implementation, making the scoping process apparent in the report and evaluation.

Timeliness (report): this is guaranteed by project submission deadlines; in general, students are advised to finish work on the product at least 2 weeks before the hand-in and then concentrate on the write-up. Timeliness is needed to ensure that the report is of the appropriate Quality (above).

Maintainability: this is that element of quality which relates to the future usability of the product – its extension or portability to other contexts etc. Maintainability should be demonstrable by reference to development documentation and process verification. In addition to commentary on the development, the report's *further work* section can be used to explore maintenance or extension issues.

5 MSc IP Presentations

Presentations are made to, and marked by, the report second marker and another academic member of staff, and are worth 5% of the project marks.

The presentation is a 10-minute talk, for which normal presentation facilities (overhead projector etc) are available. Wireless access to the student network is available.

Any presentation requiring non-standard equipment must be notified at least 14 days before the report submission deadline.

The **contents** of the presentation are:

1. Project title and objectives.
2. Context – a short summary of background and literature.
3. What was achieved, including a demonstration if appropriate.
4. Evaluation of how the project was carried out and its conclusions.

Notes

This specification is based on the outcome of the Projects Working Group (NCA, JAC, ADNE, SK, FACP, NEP, CR), and the Programme Specifications for each of the Department's degrees. The final version is based on the paper approved by BoS, April 2004.

The following documents were used to advise these definitions:

- Programme specification, approved by UTC, of the BSc/BEng:
  http://www.cs.york.ac.uk/progspecs/BSc-BEngProgSpec.html
- Programme specification, approved by UTC, of the MEng:
  http://www.cs.york.ac.uk/progspecs/MEngProgSpec.html
- Download (from www1.bcs.org.uk) of BCS Accreditation guide (see section 2.4):
  http://www-users.cs.york.ac.uk/~fiona/BCSguide.pdf
- FHEQ level descriptors for H (Honours) and M (Masters) levels (and all the others):
  http://www.qaa.ac.uk/crntwork/nqf/ewni2001/ann