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21 November 2012

Dear Professor Hamilton,

Re: MSc in Mathematical Foundations of Computer Science, 2011/2012 cohort.

I am writing to you as one of the two external examiners for the above mentioned MSc. I represent the mathematics side of this joint programme.

There were 16 candidates in all and I must say straight away that the standard of most of them was very high indeed. In fact, of all the MSc's that I have been involved in, as either an internal or external examiner, I have never witnessed such a talented cohort of students. We awarded twelve distinctions and four passes, all completely justified.

The material itself is very rigorously tested. Each candidate chooses a minimum of five courses (according to a rubric that dictates that a certain number of advanced and applicable courses must be taken). For each course a miniproject is set by the lecturer which tests both a fundamental understanding of the material as well as having an open-ended component that gives the candidate an opportunity to display some originality or, at least, some reading outside of the set texts and lecture notes. The miniprojects are marked by the lecturer who also writes a short report on each candidate's performance. It is then our job at the Michaelmas and Hilary Terms examiners' meetings to monitor the reports. Each report is looked at by two of the four examiners and only on rare occasions did we change a mark. The whole process struck me as watertight and fair.

There was, however, one case of suspected cheating that I had to deal with in consultation with our Chairman. The lecturer of a certain course was of the view that the candidate's script did not represent his own work, or at least indicated use of external sources without the necessary acknowledgement. My view was that the candidate's script could equally well be read as a genuine effort and that perhaps the lecturer was (or could be seen to be) influenced by this candidate's earlier misdemeanours. (The candidate was found to have sought help with two of his Michaelmas Term miniprojects, and on the instructions of the Proctors was awarded a mark of 0 for all his miniprojects in that term.) So the Chairman (after consultation with the Proctor) wisely decided to have the script read by another specialist in the area. I was completely happy that the incident was brought to a satisfactory conclusion and that a certain natural justice prevailed in so far as the candidate could, if he now succeeded in the challenging task of completing a Trinity Term miniproject as well as his dissertation, still obtain his MSc. In fact he did.

It was not necessary to have a Trinity Term meeting for the small number of miniprojects in that term, and all the business was conducted in a routine manner via email.

This brings me to the final examiners' meeting where we discussed the dissertations and listened to the oral presentations. I must say that the candidates were not, in general, as good at talking about their work as they were at writing about it, but that was not really the point. We simply had to be convinced that it was their own work and in all cases we were. The dissertations were of the same high standard as the miniprojects and in some cases contained publishable work.

Finally I would like to express my thanks to Professor Riordan. He chaired the meetings with great skill and sensitivity, and his efficient management of the whole assessment process was very much appreciated.

Yours sincerely,

Prof. Alex J Wilkie FRS, Fielden Professor of Pure
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To: Prof Andrew Hamilton, Vice Chancellor
c/o Mrs Sally Powell, Assistant Registrar
Education Policy Support
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October 1, 2012

Dear Prof Hamilton,

Re: Examiner's Report, MSc in Mathematical Foundations of Computer Science, 2011/2012 cohort

I attended the final examinations and the Board of Examiners meeting for this programme last week and am pleased to report as follows:

Academic standards Students on this programme choose a minimum of five modules from a large catalogue of advanced courses offered by the departments of Mathematics and Computer Science. In each of these they work on a substantial "take home" assignment. Starting in Trinity Term, they work on a dissertation supervised by a member of staff. In September, there is a brief oral examination in the presence of the external examiners.

As external examiner, I came to Oxford on three occasions, twice to evaluate coursework and last week to take part in the oral examinations. All in all, I am very impressed with the standard of work produced by the students on this programme. The coursework assignments are challenging; they require students to read up on material that goes beyond that presented in the lectures and often contain parts that require original investigation and problem solving. The dissertations are typically based on recent research developments and in many cases contain original and publishable results.

Assessment processes All course work is read and marked by the setter of the assignment and then double checked by two examiners (one external). Dissertations are read by the supervisor and a second reader. The candidate then gives a short presentation during the oral examination and engages in a scientific dialogue related to the results of the dissertation, in the presence of the second reader, two internal and two external examiners. Altogether this amounts to a robust system of double checking and moderation and I have confidence in the outcomes.

Standards of student performance Standards on this programme are exceptionally high. Throughout, the students are exposed to cutting-edge research and are engaged actively in problem solving and creative investigation. We awarded a high number of distinctions and this is entirely appropriate given the quality (and quantity) of the work completed by the candidates.

Comparability I have examined MRes candidates at two other institutions previously and find that the achievements of the Oxford cohort exceed those at one and are comparable to those at the other.

Issues I have no academic issues to raise.

Good practice There are many things that are excellent about this programme, and perhaps I just highlight the smooth cooperation of the two departments in running it.

Suggestion The assessment of students is based on written work throughout, and while candidates are required to give a short presentation of their dissertation work during the final examination, this has no influence on the final mark or classification. In some cases it seemed to me that the presentation skills of the student lagged behind his/her (considerable) skill and maturity in producing mathematical texts. I believe it would be worthwhile to consider incorporating more opportunities for *oral communication* of research into the programme. For example, each term the students could be required to give a 20 minute presentation on one of their take-home assignments. Perhaps these presentations would be attended by the rest of the class and some form of peer assessment and discussion could take place as well.

Being able to communicate their work will be an essential skill in whatever career these students will pursue in the future.

With best regards,

A handwritten signature in black ink, appearing to read 'Achim Jung', written in a cursive style.

Prof Achim Jung

Cc: Mrs Louise Sumner