2000 exams debriefing – an extended diatribe

Miles Reid

This paper is for internal discussion, and may be sanitised before it appears as part of board minutes or TQA papers. I reserve the right to produce a later draft, or to express my views in other ways.

Contents

1 Exam business

1.1 New external examiners

Nick Bingham's proposal that we have a second external to deal with pure math courses is manifestly right. As Nick says, the model should be three external examiners, one applied, one analysis, one algebra-and-geometry. The ratio of Pure : Applied exam papers is currently approx 3 : 1.

For next year, together with the new applied external and Nick Bingham (covering analysis and related areas), we should invite a second pure external to cover algebra-and-geometry.

Recommendation We should invite a representative from Statistics to our Finals board, together with the representatives from Physics and Computer Science.

1.2 Quality control on exam procedures

1.2.1 Setting and checking exams

The external examiners raised a number of points. New members of staff need more guidance on what British undergraduates expect an exam to be like, and how to lay our the question to be fair to students of different abilities. The instructions in the staff handbook are fine, but there is a problem with implementing them. Exams, particularly those set by new members of staff, must be checked by an independent checker, not just a buddy of the setter. In cases where there is some doubt, the checker (or a second checker) should be formally assigned by the exam secretary. The problem was most noticeable this year in the applied courses, with their wide diversity of subject matter, and a large number of young lecturers unfamiliar with British university procedures.

1.2.2 Scaling: policy and presentation

Recommendation A working group (N.B. Not the whole staff meeting!) should discuss what our policy on scaling should be, how it should be implemented, and how the information should be presented to the exam boards and to the students.

Argument The external examiner Nick Bingham raised the point about scaling marks on exam papers. Especially, systematic data about what scaling took place should be made available to external examiners well in advance of the meeting. He was not specifically criticising our current arrangements (although he pointed out one or two uneven features), but was making the general point that scaling should be thought out as a systematic policy, and not left to whim and to chance, and that it should be spelt out in black and white both for our student population and for TQA.

I should note that our current stated policy (that average on courses are expected to be around 55%) is wholly untenable.

1.2.3 Passing information between boards

This is a perennial problem: if a student is considered as a special case at a 1st or 2nd year exam board (e.g., for medical reasons, or because of additional information supplied by the tutor), it is vital that the views of the earlier board, together with all the information on how it was reached (not simply medical certificates, which may be quite sparse), should be included in the files for transmission to the Finals board.

The 1st and 2nd year boards should account for every absence (and zero score) on a exam component. This is important because the known errors in the current registration database will inevitably be repeated. (In some cases, whether to record deregistration, absence or zero score for a component may depend on the whim of the person entering the data.) At the Finals board, for students on the lower borderlines, we have the option of treating an absence as if deregistered, which can increase S_3 and C by as much as 3–4%, and we should be in a position to extend the same fairness or "benefit of the doubt" to second year marks.

1.2.4 MA397 Consolidations at the Honours level

Recommendation MA397 Consolidations is Core for Pass Degree students. We must clarify (e.g., in the PYDC course entry, or in a course handout) that the Finals board is not allowed to consider marks from MA397 in awarding Honours.

I think what we did this year is fair: at the II.2 and higher borderlines, we should exclude the MA397, but possibly readjust the Seymour formula so as not to disadvantage the student twice.[1] At the III borderline, it seems fair to allow the board to see S_3 and C including the MA397 mark.

1.3 Preparation for the Finals board

1.3.1 Structure of the discussion

During our Finals board, I had a floppy disk in my pocket with a preliminary draft of all the Class Lists on it, and I only edited about 8 cases as a result of the board's decision. It is curious that the whole department and externals sat for 4 hours in a very hot and stuffy committee room[2] just to achieve these 8 changes. (In comparison, about 12 cases had to be changed after the meeting to correct a number of errors and deal with appeals.)

Both Robin Ball (Physics) and Mike Paterson (Computer Science) commented that our meeting was a long slog, and that their departments have strict battle-lines drawn up in advance by a pre-board (e.g., only borderline cases can be discussed, only evidence considered at the pre-board can be

[1] There is a database problem associated with this.
[2] Couldn't we get ventilation in MI1 and MI2?

discussed), so that their Finals board can dispatch its decisions more efficiently. Whereas our last judgement involved approx 235 souls, the Finals board in Physics have only approx 120 and Computer Science approx 75.

In contrast, Nick Bingham said he liked the athmosphere of department democracy, the fact that everyone could air their views, that genuine concern for fairness and the well-being of the students was constantly kept in mind, and that most decisions were arrived at by concensus (my paraphrase).

I have taken as my job to prepare the evidence for the external examiners and the Finals board, rather than attempt to structure the discussion. All my preliminary discussions with the externals and our "internal external" were concerned to ensure that several people at the board would have a grasp of the facts when the issues were discussed. But there may be a role for more preliminary work to structure the meeting (possibly with a more active role for the chairman), and it would be a good idea to think about it next Jun, if anyone remembers.

1.3.2 Separate MMath pre-board

Recommendation An MMath pre-board should decide the degree classes of MMath finalists, and make a preliminary judgement on which 3rd year MMathers should be recommended to take the BSc. Constitutionally, this should be an "advisory panel", making recommendations to the Finals board. It could meet early, say, Week 9, Wed or Thu, 5:00 pm.

Argument

(1) 99% of the marks for 3rd and 4th year MMathers are available by Wed of Week 9.

(2) The decision on degree class for MMath finalists are mostly very simple and uncontentious, and rarely depend on getting Year 2 marks in. The pre-board could recommend that candidates X and Y be considered as borderline at the Finals board.

(3) Recommending less successful 3rd year MMathers to transfer down to the BSc (that is, taking their BSc degree and leaving without doing Year 4 MMath, see Section 2.3) is an in-house decision, and is for preference taken by mutual agreement with the students themselves and their tutors. The more time we leave for this discussion the better.

(4) Similarly, if we wish to persuade top 3rd year BSc students back into 4th year MMath as described in Section 2.2, the earlier we start the better.

(5) If the MMath papers were separate and presented for approval and discussion of borderline cases, it would shorten the Finals board marathon by 1/2 hour or 1 hour.

1.4 Practical matters

1.4.1 Room 58

Recommendation Room 58 (next to SAO) should be set aside for the use of the exam secretaries in Weeks 9 and 10, and provided with a computer linked up to the database; I requested this last year, but it got forgotten. The exam secretaries should be given short instructions on the frequently used database operations (as happened this year). The database should be trimmed of unused routines, and simplified in other ways.

1.4.2 On-the-spot recalculations during the exam board

Recommendation The exam secretary or database assistant should come to the exam board armed with a laptop running Maple, together with routines for averages, Seymour formula, etc. already programmed.

1.4.3 Database and secretarial

Problem In the old days, we had a Departmental Secretary who knew the students' names, degree courses, tutors, etc., and had sole charge of inputting this to the database. Since Fiona is part-time, the job is spread around various people, so that no single person actually knows what is in the database. This year, a huge waste of time was caused by a sequence of minor errors in dividing up the 2nd year M/MMath students into the 3rd year M and MMath streams. (To my eternal shame, the Centre's database was more accurate than our own.)

Possible solutions

1. Only the Departmental Secretary inputs this type of material into the database – other people should do it by means of a note to Departmental secretary. (I doubt if that will work.)

2. Try to get a full time Departmental secretary.
3. Have a formal check (at a fixed time, say Term 1, Week 5) that our data on degree course registration agrees with the Academic Office's data and the students' own opinion. This could be done at one of our bouts of registration mania, although accuracy has never been an especially pronounced feature of exam registration.
4. Check our data on degree course registration against the Academic Office's green "decision sheets" when these come out in May or Jun.
5. Uhm, Ehr ...

2 Structure of the MMath

2.1 Admission to MMath: Quality versus quantity

Recommendation We should view admission to MMath as similar to admission to the first year, and adjust the criteria periodically to ensure that entry to the course grows in quality as well as in quantity. At present, the single criterion for entry (White PYDC, 2.2) is that the student should get 65% on 90 Cats of Year 2 List A courses.[3] We should plan to jack this up progressively over the next few years, e.g.,

(i) increase 65% $\mapsto$ 67.5%,

(ii) insist in addition on II.1 (or even 65%) overall marks,

(iii) require that the student does some specified number of Year 2 or Year 3 options (e.g., at least one MA3xx course).

Argument It is now clear that the MMath is extremely successful, and student numbers are well over any viability threshold: approx 35 in Year 4 this year, approx 45 next year, and still growing. Within 5 years, we might be in a position to cut our Year 1 entry to 180, of whom 60 go on to MMath.

The argument for (ii) is by analogy with our admissions policy (our offer is AAB or something, and we allow B in Music or Geography as an indication of overall intellectual ability). Some MMathers may be well advised to take Business Studies or Working Spanish in Year 4 to raise their class. The

[3]Incidentally, we must clarify which Physics, Statistics and Computer Science courses count for this purpose and instruct the database accordingly; this led to several temporary errors this year.

benefits of a criterion like (iii) is shown by experience with this year's results: our regulation requiring 3rd year MMathers to take two MA4xx courses is proving an amazing success. It allows us to tell at a glance whether a third year student is on the MMath degree; it gives the exam board an idea of how the student gets his high grades; it forces the students to make adventurous choices; and it provides an audience for a range of MA4xx courses that would otherwise be too sparsely attended to be viable.

2.2 BSc $\mapsto$ MMath in Year 3

Recommendation We should set up a procedure for BSc students to be admitted into MMath during Year 3 or at the end of Year 3.

Argument When British universities set up their MMath degrees at the instigation of the LMS, clearly differentiating the BSc from the MMath was a precondition imposed on us by the politics of getting it funded by the government. (In different contexts, particularly in relations with the Centre, the distinction between undergraduate MMath and graduate MSc is also politically expedient.) Now we've won the grant, the conditions in the application are no longer obligatory. There is no point in maintaining barriers between BSc, MMath and MSc in cases where there is no advantage. When it is best academically for our kids and for us, we should encourage a pick-and-mix sequence of BSc, MMath, MSc courses.

I believe that my recommendation will benefit us at two quite different levels. The top 15 or so BSc finalists are as good as most of the first class MMathers, and it clearly benefits us if we can interest them in staying on for a 4th year. We should persuade them at several stages of their career. Up to now there were various deadlines arising from LEA notification, but presumably this will change with loans; in any case, our regulations don't have to be linked to funding considerations.

At the lower end of the scale, Admission to MMath at the end of the Year 2 exam board is currently a Yes/No decision. A "conditional offer" may be better for the department and for many of the borderline individuals concerned. We all know students getting II.2 marks who sincerely believe themselves capable of MMath MSc PhD work, and beg us to allow them to spend their parents' money and years of their lives on this. Assuming that my recommendation works legally, the best way to handle this class of student might be to exclude him from the MMath, but tell him that he can get back in later if he takes the regulation two MA4xx courses and gets II.1 marks at the end of Year 3. (We could impose conditions based on results from the April exam session.) We can set the criteria for admission at the end of Year 3 as high as we like. This would simplify the decision of the Year 2 exam board, and it would put the decision where it belongs, namely, with the students' performance throughout Year 3. The student may decide for himself in many cases that it's not worth the effort, thus saving us all a lot of trouble and bad feeling; I had a student this year in exactly this category.

2.3 MMath $\mapsto$ BSc at the end of Year 3

Recommendation We should reconsider the criteria for promotion to Year 4 MMath, in the light of the cases from previous years that we have allowed through after argument.

The MMath pass mark at the end of Year 3 is currently set at

> 50% plus four good II.1 marks on Math list A and list C options (White PYDC, 2.2.).

We could raise this to 50% $\mapsto$ 55%, or even 60%, and toughen up the wording "at least four high II.1 marks".

Argument This year, I and the tutors have advised 4 students in this class as starkly and brutally as possible that

- most MMathers get averages of 75% or over;
- the MMath is designed for students getting firsts;
- we do not intend to compromise the quality of the course just because we are carrying two or three II.2 students;
- MMath II.2 is no better for employment than BSc II.2, and a III is considerably worse;
- a student loses a year of his life and UKL25,000 in lost earnings by staying on for another year.

But the issue is always that if the individual is determined to proceed even after having the riot act read to him, it's hard to enforce our criterion. This year I have serious doubts about two of the students we allow to go forward.

2.4 MMath with computation

Recommendation We should enter into discussion with Computer Science with a view to setting up a degree course in MMath with computation, to go with our BSc in Math with computation.

Argument Computer Science have recently set up a degree of Master of Computer Science, and have Year 3 students on it. Their web page lists about 8 CS4xx courses plus the Year 4 project. There is no doubt that a viable course could be built out of existing material.

Our BSc in Math with Computing has an intake of approx 30 students, many of whom defect, and only about 10 pass out with the M/Comp degree; but several of those who stick it out are very strong students (notably my 3 tutees Wong, Wooldridge and Morgan who got first class marks and did first class projects). I believe that they get a really first class education, much better, for example, than the guys who do nothing but algebra in Years 3–4. I've asked these and other M/Comp students whether they would be interested in staying on for Year 4 as MMathers. But they all have good job offers, and couldn't face 6 or more MA4xx units next year. But it might be a different story if they had started off on a 4 year MMath/Comp degree.

2.5 Balance in MMath Year 4

One MMath student who had an unsuccessful Year 4 said something very interesting, amounting to a serious accusation of lack of balance in our Year 4:

> All the things he was interested in during the first 3 years, that is, all the nice analysis courses, seemed to have disappeared from the 4th year program. All the MMath Year 4 seemed to be boring algebra courses.

I was annoyed at all the rush for extra algebra options when we spoke to the MMathers during this year, although it seemed to be what most of the students wanted. My objection is that does not provide a healthy mathematical diet; my impression is that students who graduate from Leeds having done all the algebra options have had a much wider education. It didn't occur to me that we would be discriminating against some students. We have to arrange things better in future years.

3 Caudology

3.1 MA397 Consolidations

Recommendation We should find some device to impose MA397 Consolidations on all Third Class finalists (subject to university and course regulations – I propose one model in Section 3.3). We should also plan to introduce similar techniques and revision based material into Year 2.

Argument The course MA397 has been a great success for all involved. The benefits go well beyond the module itself, adding to the student's self-esteem, and giving him the satisfaction of doing real calculations that he can understand.

MA397 is currently Core for Pass Degree students, only recommended to the thirds, and theoretically not considered at the Honours level (see Section 1.2.4). But it would benefit almost all the Third Class finalists. Over the last two years I have argued that we offer weak students no appropriate material to study, and give them no teaching help; MA397 certainly goes a long way towards meeting the criticism.

3.2 Abolish the Pass Degree course

Recommendation We should discontinue the use of the Pass Degree course (not the award of the Pass Degree to tail-end finalists), or better still, abolish it altogether.

Argument

a. It is inhumane, discriminating against the weakest members of the community – it restricts weak students in their choice of courses, in many cases preventing them from getting Honours.

b. Of the handful of students on Pass, several climb back to Honours, and several of the Honours students drop down to Pass at Finals, so that the Pass Degree category is not at all well defined.

c. The regulations are unenforceable – at least one student on Pass took 138 Cats this year. The registration paperwork makes it impossible to police this.

d. It is an anachronism, dating back to the good old days when a degree separated the officers from the rank-and-file (presumably a Pass Degree designates officer material never to go above sub-lieutenant).

e. It adds another level to our database difficulties.

We spell out solemnly the rationale for the Pass Degree:

> a lighter load may enable them to direct their energies more realistically towards a better understanding of fewer modules (White PYDC, 6.10).

But it seems to me this bears little relation with reality in the 21st century.

3.3 A possible model: "Pass Degree for the new millennium"

Recommendation At the Year 2 Exam Board, normally, for students with $S_2 \leq 51\%$, the *only choice* should be between "Proceed to Conditional Honours" or "Fail".

For most students, the condition should be MA397 Consolidations. In outstanding cases (such as those who did more that 180 Cats), the Year 3 Cats should be capped at (say) 140; or other conditions tailored to individual cases should be imposed at the discretion of the department or the Senior Tutor. The conditions must be enforced (see next section).

Argument This year and next, there are only 4 finalists on the Pass Degree, so this band is not the main component of the tail. It seems to me that there is no point in having special (unenforceable) rules for only 4 students, when the major issue is the 30 or so kids who get $S_2 \leq 50\%$ in Year 2.

My recommendation has the following effects:

1. It withholds the "Honours" tag from students who were lazy and unsuccessful in Year 2, and serves notice on them that third class results are socially unacceptable, as well as being unwise as a career strategy.

2. It removes the inhumanity and stigma from the current Pass Degree.

3. It allows us to impose MA397 Consolidations on a whole band of students for whom it will clearly be advantageous.

4. Together with the following Recommendation 4.4, it introduces a degree of tutorial control that would clearly benefit most tail-enders, and that the current tutorial system demonstrably fails to provide.

I believe that my proposal does away with the outmoded features of the traditional Pass Degree, and replaces it with something that really gives tutorial support to the students who need it. (In fact, it is probably entirely in line with the intention of the Pass Degree when it was first set up.)

It seems likely to me that we can make this recommendation into our regular policy without any change in the University rules or course regulations – we are not introducing any new structure, just using the existing "Proceed to Honours" in a slightly different and more systematic way. There is a change to the Conventions[4] of the Year 2 Exam Board.

3.4 Tutorial role in the registration paperwork

Recommendation For all students except those on "Conditional Honours", the departmental signature on the registration paperwork should be a rubber stamp (kept in the general office or SAO). For students on "Conditional Honours", the departmental signature is the Senior Tutor (or Year 3 Coordinator) or his named delegate. Other tutors must on no account sign (de-)registration forms, and Academic Office are instructed not to accept forgeries.

Argument The two most wretched problems with our undergraduate course are:

- 3rd year tail-enders
- the "registration" problem

The two problems are strongly correlated, because the good students know how to play the exam registration game to their advantage, and don't deregister at the last minute (or forget to deregister) as an act of despair.

The problem for us with the registration paperwork is that it wastes a vast amount of tutors' time, without any compensating benefit in control or accuracy. My recommendation cuts the waste of time, and introduces control and accuracy exactly where it is needed. We trust the good students to choose their own courses, to take tutorial advice as and when they need it, and otherwise to look after themselves with a minimum of supervision, but we exert control over the tail-enders.

[4] By the way, I believe that these Conventions don't exist – don't worry, I'm sure TQA will never notice.

4 "Conventions" and relations with the Centre

In our teaching and exam system, the Math department runs a high quality show of extreme complexity for a student population of well over 600, and we handle it entirely responsibly, and with immense care and compassion. It's time to say that we have come of age, and we stand on our own feet: we cannot rely on help from the Centre, neither do we need their instructions.

At the level of minutiae, our class lists are checked by the Centre's Academic Office, but they have no interest whatsoever in the moral and intellectual substance of our course (quite properly), nor the actual contents of the lists. Experience shows that they are unlikely to detect errors in our lists, and they as likely to make mistakes as we are. When there are errors or appeals by students, it is always our responsibility to find appropriate solutions. Compared to the vast effort we put in to treating our students accurately and fairly, I was shocked this year to discover the extent to which the Academic Office is concerned solely with getting the lists ready for the parades on graduation day. After our arguments last friday, it would not surprise me if some student's rights (e.g., to be considered by the Aegrotat board) is summarily curtailed for the sake of deadlines for printing publicity material. The Academic Office is also responsible for the preregistration registration deregistration reregistration registration amendment paperwork that adds so much to the richness and diversity of our lives.

At the higher organisational level, overenthusiastic centrocrats decided 2 or 3 years ago to impose uniform "Conventions" on different departments, presumably as a response to TQA and other pressures. We had already implemented practically every useful point in the draft conventions many years earlier. Our course description booklet White PYDC provided detailed information on our procedures to students years before the Centre even thought of it; many University departments have got a lot to learn from us in this respect. Over the last 2 years, there was consistent pressure on us to adapt our procedure to these conventions, and we gave way on a couple of points (most significantly, raising the pass/fail borderline to 35%). Now, to my relief, we receive instructions not to revise anything until the Working Party set up by the Centre's Academic Policy Committee has had time to prepare and consider proposals for the harmonisation .... It seems clear to me that uniformisation for its own sake is a very substantial encumbrance with little or no benefit. One thing has improved: we can now discuss these matters directly with the Academic Policy Committee (Professors John Jones and Susan Bassnett), instead of having to argue via intermediaries in the Academic Office.

I'm not specifically handbagging the Centre. Rather, by taking firm responsibility for our own affairs, we contribute more usefully to the proper running of the University as a whole. The Math department should be at the heart of the University, but not run by the University.

Jul 2000,
Miles Reid,
Math Inst., Univ. of Warwick,
Coventry CV4 7AL, England
e-mail: miles@maths.warwick.ac.uk
web: www.maths.warwick.ac.uk/~miles

Appendix – letter from Sydney

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From miles Wed Dec 20 10:38:45 2000
Subject: Pass degree students
To: mastaff
Date: Wed, 20 Dec 2000 10:38:45 +0000 (GMT)

Dear Colleagues,

while you are all sitting down to enjoy the staff meeting on Wed 10th
Jan 2001, I will unfortunately still be suffering the hospitality of
Quantas.

I wish to raise one item of Exams business or Teaching business at the
staff meeting. I discussed this point in detail in my exam postmortem
document last Jul 2000, and privately with the chairman, deputy chairman
and several others.

My proposal is to discontinue the current use of the "Pass degree" as a
course of study, and replace it with "conditional honours", applied to a
wider section of the student population. I argued in my postmortem that
the current pass degree course is outdated, unfair, unenforceable, a huge
waste of time, caters very badly for a fairly random set of 3 or 4 students,
and has almost nothing to do with the actual needs of the student population
in this new millenium. My alternative proposal is that students who survive
Year 2 with <= 55\% should not be passed forward with Honours to Year 3 by
the 2nd year Exam board, but "permitted to proceed to (conditional) Honours".
The department (that is, the tutor and Year 3 coordinator) retains control
over what courses these kids register for, and can enforce Consolidations or
other appropriate options. My proposal is not to change the Univ. rules, but
to modify the way we interpret them -- in particular, "proceed to honours"
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is a decision of the 2nd year exam board, and how the department approves students' registration for exams is entirely within our control.

In other words, instead of the discredited and manifestly worthless "Pass degree", our efforts should be directed into building a system that genuinely supports 25 or 30 of our weakest students with an appropriate course of study, and a carefully thought out system of threats and rewards to make sure they get something out of it. My proposal and how to implement it is discussed in much more detail in my postmortem document mentioned above.

I wish you all a super solstice.
Best, Miles