

# UNIVERSITY OF GLASGOW

## Report of the Review of Departmental Programmes of Teaching, Learning and Assessment of the Department of Mathematics

13 March 2003

### Review Panel

Professor Jack Carr, Professor of Mathematics, Heriot-Watt University – External subject specialist

Mr Matthew Hastings, Senate Office – Panel Secretary

Professor Robin Leake, Vice-Principal Estates and Territorial Vice-Principal (Science and Engineering) [Convener]

Dr Sarah Mann, Teaching and Learning Service

Professor Edmund Robertson, Professor of Mathematics, University of St Andrews - External subject specialist

Professor David Watt, Senate Assessor on the University Court

### A. Introduction

The Department of Mathematics was last reviewed internally in May 1993. A joint Teaching Quality Assessment of Mathematics and Statistics was undertaken by the Scottish Higher Education Funding Council (SHEFC), in August 1994 and achieved a 'Highly Satisfactory' rating. The Department improved its rating to 5 in both Pure and Applied Mathematics in the 2001 Research Assessment Exercise.

The Department provided a Self Evaluation Report and supporting documentation in accordance with the University's requirements for the Review of Departmental Programmes of Teaching, Learning and Assessment.

The Review Panel met with the Head of Department, Professor David Fearn and with undergraduate students from all levels. A number of the students were elected student representatives. The Panel also met with four postgraduate research students who also acted as Graduate Teaching Assistants (GTAs), representing hourly paid staff in the Department, and with the Departmental administrator and nine members of key academic staff.

There were no Taught Postgraduate programmes operating in the Department at the time of the Review.

The Review Panel considered the following range of provision offered by the Department:

Honours programmes [BSc/MA and MSci (Hons)]

- Honours Mathematics (Single or Combined);
- Honours Applied Mathematics (Single or Combined);
- Honours Mathematical Sciences;

Designated degree [BSc]

- 3-Year Degree with Mathematics as a designated subject.

Level 1 and 2 provision

Service teaching for Engineering

## **B. Report Summary**

The Review Panel found the Department to have an excellent range of undergraduate provision and that the Self Evaluation Report offered an accurate overview of that provision by being both clear and informative.

A number of areas of good practice were identified and commended by the Panel such as:

- a) the flexible curriculum informed by research;
- b) the student documentation and departmental website;
- c) the high quality of organisation;
- d) the good support systems for students;
- e) the adherence to the Quality Assurance Agency subject benchmark statements for mathematics; and
- f) the attempt to close the loop on student questionnaires by offering a summary of feedback to students.

In addition, the undergraduate course guidelines, including the documentation available on the student website, were found to offer excellent information which assisted students in the planning of their studies as well as offering access to test material and recent past examination papers. The Panel acknowledged the commitment required by the Department to keep the website updated. The Panel also commended the Department's strength in offering a range of Level 1 courses suitable for the divergent backgrounds of its student intake. The Department was also found to pay good attention to progression through the levels by offering a mixture of solid traditional courses along with some innovative Level 2 modules. Similarly, the Honours programme was commended for offering a balance of traditional and innovative courses.

The Review Panel considered that assessment procedures in the Department were exemplary and the External Examiners' reports testified to the fact that standards were high and student achievement was in line with, and in some cases was in excess of, that of other universities.

The undergraduate students who met with the Review Panel were positive with regard to the Department and when asked if they would recommend the Department to friends all agreed that they would be happy to do so.

The Review Panel concluded that the provision under review was of excellent quality and it was clear that the Department was successful and well run. The Panel noted its support for the activities of the Department and wished to offer constructive feedback on areas where enhancements could be made. The Panel wished to recommend that the Department give consideration to the following issues and where appropriate issued recommendations as set out below.

## **General**

### *1 Faculty Entry System*

The Review Panel explored with the Head of Department his views on the Faculty entry system for students. The Head of Department was in favour of the Faculty entry system as it allowed students flexibility. He also commented in his opinion Mathematics benefited from this system. The Review Panel asked the Head of Department if he was happy with the admission of students intending Honours in Mathematics. He responded that he was satisfied and had seen evidence that the general balance of students entering the University to take Mathematics and leaving with Mathematics rather than transferring to another subject was improving.

## 2 *Honours Options*

The Review Panel raised with the Head of Department the issue of student numbers on Honours options. From the centrally provided figures in the documentation, it appeared as if there was only one student on a 3H Honours option. The Head of Department pointed out that the figures were misleading in their presentation, as Honours students were enrolled under their Honours programme and not their individual courses / modules. The figures therefore, only reflected the visiting student numbers. At the time of the Review the Head of Department estimated that there were approximately 90 students on the 3H route. This was an example of where Departments and The Planning Office should collaborate to cross-check the figures. The Review Panel therefore **recommends** that the Department and the Planning Office collaborate on the accurate presentation of the student figures, checking in 12 months' time that the two sets of figures tally.

## 3 *Gender and Ethnicity*

The Review Panel asked the Head of Department about the gender balance and ethnicity intake to the Department and was informed that gender was equally distributed between males and females. In terms of ethnicity, it was reported that the main intake to the Department was from the West of Scotland but that this included a number of ethnic minority groups. It was also reported that the intake of Chinese students was increasing.

## 4 *Postgraduate Diploma*

The Review Panel discussed with the Head of Department the position of the Postgraduate Diploma in Mathematics. This programme was listed on the Department's Web site as being available at the time of the Review. The Head of Department informed the Panel that this Diploma used to receive funding but since this had become unavailable, there had been few students on the programme and none for a number of years. The Review Panel suggested that the programme should be withdrawn using the University's Course Approval Process via the Central Course Information Management System, particularly as, unlike the rest of the Department's provision, it did not comply with the Scottish Credit and Qualifications Framework (SCQF) guidelines. The Review Panel **recommends** that the Department should withdraw the Postgraduate Diploma in Mathematics via the University's Course Approval Process. Should the Department decide not to withdraw the programme then it should be revised to ensure that it complies with the requirements of the SCQF for a taught postgraduate programme.

## **Teaching and Learning**

### 5 *Interpersonal and Transferable Skills*

- 5.1 The Review Panel explored with the Head of Department the issue of interpersonal skills and how these were taught within the Department. The Panel was informed that team projects were offered at Junior Honours level and these provided development in leadership, presentation and in working as a team. These projects were assessed on the basis of staff and peer review and also on a jointly written report.
- 5.2 The Panel also enquired of the Head of Department if any specific guidance was offered to students on working in teams, and was informed that some limited guidance was offered and that students completed a trial run of a team working exercise before undertaking a second team exercise, which was assessed. The Review Panel **recommends** that the Department give further consideration to how to introduce team working and transferable skills from Level 1 onwards and should consult the Teaching and Learning Service for guidance.

## 6 *Teaching Methods*

At the meeting of the Review Panel with key staff, the issue of the Department's continued use of chalkboards as the preferred presentational medium was raised. There was considerable discussion of the problems the Department had experienced in selecting chalk adequate for the purpose and also of the poor condition of the chalkboards and lecture theatre lighting around the University campus. The staff informed the Review Panel that some members of staff did mix their presentational methods to include overhead projectors and whiteboards but that, in general, they preferred chalk for teaching mathematics. The key staff were open to a mixture of presentation methods if the correct balance was struck. At the meeting of undergraduate students with the Review Panel, the students were generally supportive of the Department's continued use of chalkboards. Nevertheless, the students also mentioned that a mixture of methods would be welcomed. The Review Panel **recommends** that the Head of Department should encourage all teaching staff to consider the use of alternative forms of presentation (whiteboards, OHP, projected computer screens, etc.) in addition to chalkboards. The University's Teaching and Learning Service were able to offer advice and the opportunity to test out new methods of teaching.

## 7 *Private Study*

The Panel had noted from the Self Evaluation Report and supporting documentation the Department's concerns about the small number of hours spent by students on private study and sought the Head of Department's views on how this problem might be tackled. The Head of Department considered this was likely a result of financial pressure on students with the result that most had to take on part-time work which reduced the potential time for study. He further commented that this was not an uncommon situation for all students and was unsure as to how the Department could assist in increasing student time spent on private study.

## 8 *Graduate Teaching Assistants*

8.1 The Graduate Teaching Assistants (GTAs) who met with the Panel were positive about their experiences in the Department. General postgraduate training had come from the Faculty Graduate School but staff in the Department had been very approachable if they had any problems or queries. They informed the Panel that they had started teaching in larger tutorial groups where there were other GTAs and a member of the Department's academic staff present. This had helped to build their confidence before taking smaller tutorial groups on their own. It was also noted that overseas PhD students did not take tutorials in their first year in order for them to settle in and become more comfortable with any language adjustments. It was the view of the GTAs that the consistency of tutorial provision within the Department could be more systematic and that they would welcome more regular meetings with members of the academic staff in order to stay up-to-date. The Review Panel **recommends** that the Department should consider introducing more regular meetings between academics and Graduate Teaching Assistants with a view to enhancing the consistency of tutorial provision across the Department.

8.2 The GTAs who met with the Review Panel also commented that they did not always receive student feedback information by which to monitor their own performances. The Review Panel **recommends** that the GTA's should also receive all relevant feedback from the normal Staff-Student Liaison Committees.

## **Curricula and Assessment**

### 9 *Projects*

The Review Panel had noted that a project for the forthcoming MSci degree was compulsory, while the BSc degree project was optional. The Head of Department informed the Panel that it

was not compulsory for the latter, due to the potentially increased staff workload arising from a greater number of compulsory projects. The Review Panel also noted that the Department was working on marking guidelines for projects and that at present all were double marked within the Department. Where similar marks were awarded the average was applied and where there was a divergence, discussion was entered into to resolve the issue. The Head of Department explained that the projects did not currently have a compulsory presentation element but that this requirement would be introduced with the forthcoming MSci degree. The Review Panel **recommends** that the Department should consider the possibility of introducing a wider choice of project for students other than those for whom a project is compulsory on the forthcoming MSci degree in Mathematics. The Department should also consider the introduction of a compulsory final year project for all BSc Single Honours students.

#### 10 *Examinations as Main Assessment Method*

The Review Panel noted the Department's heavy reliance on examinations as a method of assessment and raised this at the meetings with undergraduate students and the Head of Department. The undergraduate students who met the Panel were generally in favour of the introduction of some continuous assessment, particularly at the Junior Honours Level. The Head of Department was receptive to the idea but did suggest that, due to the right or wrong nature of Mathematics as a subject, examination as a form of assessment did lend itself well towards the assessment of Mathematics. The Head of Department was also concerned that the introduction of continuous assessment might lead to students copying each others work. The Review Panel suggested that making a limited amount of continuous assessment count towards the final mark was an acceptable risk in these circumstances. The Review Panel **recommends** that the Department should consider introducing continuous assessment as an alternative to examination.

#### 11 *Scaled Marking System*

At the meeting of the Review Panel with the Head of Department the issue of a scaled marking system at Junior and Senior Honours was raised. The Panel noted that scaling did not make much of a difference at Junior Honours (where all students take the same modules) but at Senior Honours (where every student could take a different combination of modules) it could have a large impact on a small number of students. The Head of Department commented that the Department was looking at ways to standardise and explain the marking system more clearly. The Review Panel **recommends** that the Department should consider introducing a transparent and standardised marking system, particularly at Junior and Senior Honours.

### **Learning Resources**

#### 12 *Balance of Pure to Applied Mathematicians*

The Review Panel had noted from the documentation the balance between Pure and Applied Mathematicians within the Department was possibly not ideal from a teaching viewpoint. At the time of the Review there were more Pure than Applied Mathematicians in the Department. The Head of Department agreed that this was the case but explained that it would be difficult to impose more Pure Mathematics onto students, particularly those in second year as they were only able to take Mathematics subjects for a maximum of 50% of the time. In any case, this might not be a sensible move if the main body of students wish a balanced Mathematics degree. The Head of Department also informed the Panel that at the time of the Review there was no demand for a separate Pure Mathematics degree.

#### 13 *Photocopying Allocation*

In the meeting with the undergraduate students, some had expressed an opinion that the allocation of photocopying credits from the Department was inadequate, given that some

lecturers referred students to notes and handouts on the Department's web pages. It was also clear from the meeting with the undergraduate students that the distribution method for handouts varied between members of staff. These points were raised with the Head of Department, who had not been aware of any problems with the allocation of photocopying credits but would look into the matter. Thus, the Review Panel **recommends** that the Head of Department should review the distribution methods for handouts used by academic staff and the adequacy of the photocopying allowance the Department provides for students.

#### 14 *Timetabling*

At the meeting of the Review Panel with the Undergraduate Students there was a consensus of opinion that the issuing of the final timetable to students had been quite late and had caused some difficulty for students trying to choose options in another subject. The timetabling problem had arisen at Junior Honours level and was of particular concern as the students confirmed that the clash involved compulsory subjects in Mathematics and Physics. At the meeting of the Review Panel with the Head of Department, he explained that the issuing of the timetable often depended upon other subjects and the availability of appropriate accommodation. He was not aware of particular timetable clash problems with the Physics Department and was keen to investigate this matter. The Review Panel **recommends** that the Head of Department should consider measures by which to issue the students' timetables earlier and investigate student comments relating to timetable clashes with the Department of Physics.

### **Maintenance and Enhancement of Quality and Standards**

#### 15 *Communication*

The students raised with the Panel the issue of the Department's methods of relaying of information to students. They informed the Panel that methods had ranged from announcements at lectures and e-mail messages to notices on the Departmental noticeboard. In one particular example, when a Departmental computing cluster was not available, many of the students had not received a message. As a result of this, the students were keen for the Department to follow a set procedure for contacting students in such cases. However, it was conceded that some students did not look at noticeboards or regularly check their e-mails. The Panel **recommends** that the Head of Department should consider introducing more formal or standardised measures for contacting students such as e-mail, lecture announcements and departmental notice boards.

#### 16 *QA Officer*

It was noted that the Head of Department was also the Departmental Quality Assurance Officer and in most Departments this was generally a delegated responsibility. The Review Panel **recommends** that the Head of Department should discuss with his Departmental Management Committee how this job might best be devolved.

#### 17 *Review of Departmental Provision*

The Review Panel explored with the Head of Department the timescales and process for reviewing the whole of the Department's provision. He commented that this was last undertaken when the University introduced a system of modularisation. At the time of the Review, the Department had not set a timetable for reviewing the provision offered at a particular level as Departmental priorities were subject to change. The Review Panel **recommends** that the Head of Department should speak to Course Co-ordinators to initiate regular reviews at each level.

## **Student Progression / Support**

### *18 Disability and Inclusivity*

- 18.1 The Panel raised with the Head of Department the issues of disability and inclusivity. The Panel was informed that the Department had not looked at this issue specifically but that it had recent experience of accommodating one wheelchair-bound student. The Head of Department noted that it was difficult to engage with special needs students at Level 1 when they did not fall wholly into the jurisdiction of the Mathematics Department but the Department did its best to accommodate such students. The Head of Department also commented that information on the disability of a student from the Student Recruitment and Admissions Service and the Special Needs Service was often misleading and cited a recent example. In this case the Department had been informed that a student had a severe disability requiring a number of specialised facilities for access. The reality was that only a number of minor alterations was sufficient to solve the access problem to the student's satisfaction. Therefore, the Review Panel **recommends** that the Special Needs Service should consider the provision of a more accurate statement of student requirements to allow departments to take appropriate action.
- 18.2 The Head of Department also observed the trend whereby increasing numbers of students with special needs required a separate room in which to sit examinations, sometimes including the need of a scribe and / or a computer. This was seen as having the potential to cause a strain on the resources of the Department.

### *19 Widening Participation*

The Review Panel explored with the Head of Department the Department's participation in the University's Summer School. He commented that Mathematics had been committed previously to supporting the Summer School's efforts to bring in students from non-traditional backgrounds to the University. However, it had appeared to the Department that activity in this area had been reduced. The Review Panel **recommends** that the Widening Participation Service discuss with the Head of Department ways in which to increase the involvement of Mathematics with the University's Greater Opportunity of Access and Learning with Schools (GOALS) programme and the University's Summer School.

### *20 Employability and Careers Information*

The Review Panel discussed with the Head of Department the issue of feedback from employers on what they were looking for in graduates from the Department. The Head of Department described how employers valued students with a good degree but that they were also interested in the students' extra curricular activities, rating such things as sports team captaincy highly. The Review Panel also noted that some employers offered curriculum vitae workshops for students of the Department.

### *21 Student Motivation*

In the meetings of the Review Panel with the Head of Department and with the key staff, the Review Panel raised the issue of poorly motivated students and students who were disruptive, as noted in the Department's Annual Course Monitoring Reports (ACMRs). It was generally agreed that student apathy was a widespread problem, not only affecting Glasgow University. The Department's response generally was that the onus to study was on the student but that the Department had taken steps to put more lecture materials onto the Departmental Web pages in order to help combat the problem. On the issue of unruly students, the comment on the Annual Course Monitoring Reports had come about as a result of Level 1 students persistently talking in lectures, despite being regularly chastised by the lecturer. Key Staff commented that the Mathematics Department had high standards and expected students to be courteous and listen during lectures. It was also noted that the ACMR comments referred to one particularly

troublesome year and staff pointed out that this problem was not now so evident in subsequent student cohorts. The Review Panel **recommends** that the Department should consider the development of a strategy for dealing with disruptive or disinterested students. Advice might be sought from both the University's Teaching and Learning Service and Human Resources Service.

## 22 *Feedback to Students*

Some undergraduate students told the Panel that they would appreciate more formal feedback from the Department on their progress throughout the year. The students informed the Panel that staff in the Department were approachable on this subject but that a more consistent form of feedback would be beneficial to all students. The Review Panel therefore **recommends** that the Department should consider introducing a mechanism whereby students could be provided with regular formal feedback on their progress on courses.

## C. **Conclusions and Recommendations**

The Review Panel commends the Department for the overall high quality of provision and for its excellent organisation and commitment to, and support for, its students.

The recommendations interspersed in the preceding report and summarised below are made in the spirit of encouragement in order to enhance the already high standards of the Department of Mathematics. The recommendations have been cross-referenced to the numbered sections in the report to which they refer.

### **General**

1. The Department and the Planning Office should collaborate on the accurate presentation of the student figures. [refer to section 2]

**Action: Head of Department and the Planning Office**

2. The Department should withdraw the Postgraduate Diploma in Mathematics via the University's Course Approval Process. [refer to section 4]

**Action: Head of Department**

### **Teaching and Learning**

3. The Department should give further consideration to how to introduce team working and transferable skills from Level 1 onwards and should consult the Teaching and Learning Service for guidance. [refer to section 5.2]

**Action: Head of Department**

4. The Head of Department should encourage all teaching staff to consider the use of alternative forms of presentation in addition to chalkboards. [refer to section 6]

**Action: Head of Department**

5. The Department should consider introducing more regular meetings between academics and Graduate Teaching Assistants with a view to enhancing the consistency of tutorial provision across the Department. [refer to section 8.1]

**Action: Head of Department**

6. The Review Panel **recommends** that the GTA's should also receive all relevant feedback from the normal Staff-Student Liaison Committees. [refer to section 8.2]

**Action: Head of Department**



## **Curricula and Assessment**

7. The Department should consider the possibility of introducing a wider choice of project for students other than those for whom a project is compulsory on the forthcoming MSci in Mathematics. [refer to section 9]

**Action: Honours Convenor and Head of Teaching**

8. The Department should consider the introduction of a compulsory project for BSc Single Honours students. [refer to section 9]

**Action: Head of Department and Head of Teaching**

9. The Department should consider introducing continuous assessment as an alternative to examination. [refer to section 10]

**Action: Head of Department and Head of Teaching**

10. The Department should consider introducing a transparent and standardised marking system, particularly at Junior and Senior Honours. [refer to section 11]

**Action: Head of Department and Head of Teaching**

## **Learning Resources**

11. The Head of Department should review the distribution methods for handouts used by academic staff and the adequacy of the photocopying allowance the Department provides for students. [refer to section 13]

**Action: Head of Department**

12. The Head of Department should consider measures by which to issue the students' timetables earlier (and to help eliminate timetable clashes with the Department of Physics). [refer to section 14]

**Action: Head of Department**

## **Maintenance and Enhancement of Quality Standards**

13. The Head of Department should consider introducing more formal or standardised measures for contacting students such as e-mail, lecture announcements and departmental notice boards. [refer to section 15]

**Action: Head of Department**

14. The Head of Department should discuss with his Departmental Management Committee how the role of Departmental Quality Assurance Officer might best be devolved. [refer to section 16]

**Action: Head of Department**

15. The Head of Department should speak to Course Co-ordinators to initiate regular reviews of Departmental provision at each level. [refer to section 17]

**Action: Head of Department**

## **Student Progression / Support**

16. The Special Needs Service should consider the provision of a more accurate statement of student requirements in order for the Department to take appropriate action. [refer to section 18.1]

**Action: Director, Special Needs Service**

17. The Widening Participation Service should discuss with the Head of Department ways in which to increase the involvement of Mathematics with the University's Greater Opportunity of Access and

Learning with Schools (GOALS) programme and the University's Summer School. [refer to section 19]

**Action: Head of Department and Widening Participation Service**

18. The Department should consider the development of a strategy for dealing with disruptive or disinterested students. [refer to section 21]

**Action: Head of Department with assistance from Teaching and Learning Service and Human Resources Service**

19. The Department should consider introducing a mechanism whereby students could be provided with regular formal feedback on their progress on courses. [refer to section 22]

**Action: Head of Department and Head of Teaching**

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