

UNIVERSITY OF GLASGOW

Education Committee - Monday 14 June 2004

**Departmental Programmes of Teaching, Learning and Assessment -
Report of the Review of the Department of Mechanical Engineering -
Thursday 24 April 2003**

Dr Jack Aitken, Head of Senate Office

1. Panel Membership

Professor Andrew Nash, Vice-Principal (Learning & Teaching)/Clerk of Senate
(Convener)

Professor Joe McGeough, Regius Professor, School of Engineering and Electronics,
University of Edinburgh

Dr Bob Matthew, Director of Teaching & Learning Service

Professor David Bennett, Faculty of Veterinary Medicine and Senate Assessor on the
University Court

Dr Jack Aitken, Head of the Senate Office **(Panel Secretary)**

2. Review Format

2.1 The Department submitted documentation to the Panel concerning its provision in learning, teaching and assessment in accordance with University procedures. In addition to the private deliberations of the Panel, during the day of the review, the following activities took place:-

- Two meetings with Head of Department
- Tour of departmental facilities
- Meeting with group of undergraduate students
- Meeting with key departmental staff
- Meeting with Graduate Teaching Assistants
- Meeting with probationary staff
- Meeting with the Dean of the Faculty of Engineering

3. Scope of Review

3.1 The review encompassed the following degree programmes, to which the Department recruited students: MEng/BEng in

- Mechanical Engineering
- Mechanical Engineering with Aeronautics
- Mechanical Engineering with Electrical Engineering

- Mechanical Design Engineering
- Product Design Engineering [Offered jointly with Glasgow School of Art]
- Mechanical Engineering (European Curriculum)

4 Student Matters

4.1 Recruitment, Induction, Retention and Integration

- 4.1.1 Documentation and discussion with students and staff demonstrated an impressive level of commitment to, and success in, student recruitment and induction. It was noted that, in order to have full control of the applications process, the Department managed the associated system directly rather than through the central University Service. Students reported that pre-entry information provided had been realistic, and that departmentally based induction activities were generally better in quality than those centrally provided. Some undergraduates reported problems experienced during matriculation.
- 4.1.2 The Panel was pleased to note the department's efforts and success in widening access, particularly within the Glasgow area. Associated difficulties with retention were acknowledged.
- 4.1.3 Overseas recruitment had become more difficult in recent years, due to economic circumstances in previously buoyant areas such as Singapore. Problems due to the shrinkage of such markets were compounded by more intense competition, with associated pressure to offer discounted fees.
- 4.1.4 The Panel acknowledged the considerable attention the Department paid to the early stages of degree programmes, noting the effort expended in improving retention. In this regard, the Panel praised the introduction of tests in Mathematics which required students to attain 100%; it was noted that this had benefited pass rates in end of session examinations. The Panel anticipated that the introduction of the Engineering Applications course in Level 1 would also contribute further to improvements in retention. Whilst some students dropped out of the Department's degrees, a proportion were retained elsewhere, either within the University or in other HEIs.
- 4.1.5 The Panel commended the Department's success in integrating students from overseas and domestic ethnic minorities as reported by both undergraduates and postgraduates, and was pleased to note the increasing proportion of women in the student population. The efforts made in the latter regard were particularly impressive.
- 4.1.6 The Panel noted the frustrations expressed by the Department regarding the operation of the 'pink form' system for extending the duration of examinations for students with special needs. There had been one particular case which had been resolved, but there was a level of concern that extensions to the duration of examinations were in general granted too readily. The latter concern had been echoed elsewhere, and would be taken into consideration in the course of the current review of the Special Needs Service.

4.2 Relations with Department

- 4.2.1 The Panel was pleased to hear students report that staff were very approachable and interaction was rarely intimidating. Students praised the three-day, outward-bound teambuilding exercise that took place in Year 1 of the Mechanical Engineering degrees. Product Design Engineering (PDE) students reported that requests to be included in the courses had been refused. Staff reported that the request had, with regret, been rejected due to cost, although, unlike Mechanical Engineering counterparts, PDE students benefited from a week-long visit to prestigious European companies later in their course. Students reported that, overall, they felt a sense of shared ownership of their courses that increased as they progressed in their studies. Students had some

familiarity with the range of pastoral and other support services available beyond the Department.

- 4.2.2 Students reported that the Student-Staff Liaison Committee was effective and responsive. Meetings would be brought forward where pressing issues arose, and feedback was good. Students on the PDE course reported that the equivalent committee at Glasgow School of Art was similarly effective and also characterised by cordial staff-student interaction. In the discussion with Graduate Teaching Assistants, GTAs expressed a desire for feedback from students on their teaching. In part a consequence of this, the Panel took the view that there should be GTA representation on the SSLC. This was not presently the case.
- 4.2.3 Students felt that the student representation system was successful in effecting change. Whilst not every course had an elected representative, in all but a few exceptional cases, Year representatives were appointed at least. The potential for difficulties stemming from the lack of a representative for a particular course was ameliorated by the cohesive nature of the Department's provision and of the student body itself. Students reported dissatisfaction with aspects of the training of class representatives provided by the Students' Representative Council. The event had been overlong, and had been characterised by an adversarial approach to the University that did not reflect fairly the tenor of student-staff relations in the Department. The Panel considered that this matter should be investigated.
- 4.2.4 Students expressed the view that the Department tended to rely over much on informal methods of communicating with students, in particular, word-of-mouth. The Panel recommended that the Department consider means for addressing this matter. The Panel also took the view that the Department should consider producing student handbooks using ring binders or a similar format to facilitate annual updating. The Panel also endorsed a student request that consideration be given to providing answers to tutorial problems on the departmental web site.

4.3 Careers & Employability

- 4.3.1 The Panel recognised that the Department attracted good quality students. Due to changes in the nature of local industry, there was increased competition for jobs for graduates. The reputation of the University's Mechanical Engineering degrees contributed significantly to graduates' prospects for entering employment. It was expected that the new degrees introduced would help to maintain the high level of graduate employment. It was important, however, to be aware of the areas of industry graduates entered. The difficulties of obtaining valuable destination statistics, particularly longer-term data, were recognised. It was suggested that the Department could establish its own records, and that the Faculty might help or co-ordinate this activity. It was also recommended that the Department, in conjunction with the Careers Service, should seek to identify ways to introduce careers education into the curriculum earlier and more systematically than was presently the case.

4.4 Financial Pressures on Students

- 4.4.1 Students whom the Panel met estimated that over 50% of the Department's students had part-time jobs. This was also the perception of staff. As a consequence, opportunities for engaging in extramural activities were restricted. One member of staff commented on difficulties with student motivation, although the Panel did not expressly explore any link between this and financial pressures.

5. Curriculum

5.1 Curriculum Development

- 5.1.1 The Panel explored with staff the possibility of introducing new, hybrid degrees that combined elements of Mechanical Engineering with provision in different disciplines. Staff responded that there had been discussions concerning Sports Engineering, an area specifically suggested by the Panel, and that the Dean of the Faculty was supportive. While acknowledging that care was essential in planning the curriculum for this purpose, the Panel encouraged the Department to develop a degree that would meet with accreditation criteria. The Panel also recommended that the Department should resolve with the University's Academic Regulations Committee any issues concerning the Scottish Credit & Qualifications Framework and a possible Masters degree in Sports Engineering.
- 5.1.2 The Panel recognised that the Department made steady efforts to diversify and also that there were opportunity costs involved in developing new areas, but encouraged the Department to consider expanding provision where possible, with reference particularly to nano/microengineering.

5.2 Inter-institutional and inter-departmental Relations

- 5.2.1 Staff reported that formal relations with counterparts at the University of Strathclyde were limited. In manufacturing, an area where the Department would have welcomed the opportunity to reinforce its own provision through collaboration, there was relative weakness at Strathclyde also. In addition, the research interests of staff at the two universities lay in different areas.
- 5.2.2 In response to a query from the Panel, the Head of Department expressed the view that it was too early to judge the level of success of the recently introduced degrees combining Mechanical Engineering with Electrical and Aeronautics. Arrangements were more straightforward in the case of the Electrical Engineering collaboration.

5.3 Student Workload & Course Credits

- 5.3.1 The Panel endorsed the Department's recent alterations to phase and reduce project work for BEng and MEng students. The Department was also encouraged in its efforts to harmonise workloads and course credits.

5.4 Industrial Projects

The Panel discussed with the department the quality assurance of industrially based projects, and it was explained that the numbers of such projects were low. This facilitated the ability of the Department to manage students' experiences. Additionally, projects were based in companies well known to the Department through the activities of the Department's Industrial Liaison Committee. It was frequently the case that company staff who supervised students were former university lecturers.

6 Assessment

6.1 Student Peer Assessment

- 6.1.1 The Head of Department confirmed that there had been no negative student feedback on experience of peer assessment of Year 2 design projects. Difficulties were more likely to arise in the course of the Year 4 exercise, but these were limited and had diminished in recent years.

6.2 *Departmental Assessment Practice*

6.2.1 With regard to marking practices, staff explained that the Department did no blind double-marking of examination scripts, beyond that carried out by External Examiners. Staff involved in marking papers from the same course would meet to discuss borderline issues that arose. All projects were double-marked.

6.3 *Student Anonymity & Examination Board Practice*

6.3.1 The Head of Department commented on negative effects of the University Code of Assessment stemming from the requirement that students should not be identified to the Examination Board. This requirement tended to make discussions artificial where, in view of the circumstances affecting the person in question, the student's identity was apparent to examiners. At the other extreme, completely anonymous consideration of results tended to reduce the role of the Boards to that of arithmetical checking. The Panel advised that it was important to adhere to the spirit of the Code of Assessment in this regard. Typically, consideration of personal circumstances could emerge following confirmation of marks. The range of membership of the Board would act to maintain objectivity and strict fairness. However, it was agreed that the Panel would recommend that the University Assessment Working Group should review the statement contained within the University Calendar concerning student anonymity as Examination Boards, with a view to clarifying the parameters within which anonymity should be preserved in discussion.

7. **MEng/BEng (Honours) Product Design Engineering**

7.1 *Design and Engineering Balance; Accreditation*

7.1.1 The Panel had wished to explore with the Department aspects of the MEng/BEng in Product Design Engineering, which was a joint degree offered in conjunction with Glasgow School of Art. The Panel was pleased to hear that relations in general terms between the two institutions were good and improving. Much of the discussion during the DPTLA review stemmed from the need to balance engineering and design components of the degree. There were complicated consequences of this. There had been much reflection following the most recent accreditation visit by the Institute of Mechanical Engineers (IMechE), the report of which had urged that greater emphasis be placed on engineering subjects in the degree. One result of this had been a change to broaden significantly the number of staff from the Department involved in the delivery of the PDE degree, particularly regarding project supervision. Staff agreed that this had been a beneficial development.

7.1.2 Discussion with both students and staff included the issue of PDE students' workloads. This had been commented upon recently by an External Examiner. It was reported that the intense nature of the degree had impacted upon retention levels. There was concern that, as a discipline, design tended to be highly competitive and, partly as a consequence of that, there was an expectation that students would spend lengthy periods in studio, particularly when pursuing project-related work. There were concerns that expectations were not proportionate to credit associated with courses, in particular, the Level 2 Project. The Panel recommended that this matter be reviewed by the Joint Board for the degree. The view was also put that this aspect of the culture in design studies tended to impact on the time students were able to devote to engineering studies. The Panel endorsed the view expressed by students that there required to be full collaboration between the two institutions in the phasing of assessments.

7.1.3 Although one of the main attractions of the degree was the possibility it offered for entry to another area of industry beyond mechanical engineering itself, students as well

as staff evinced a strong sense of the importance of accreditation of the PDE degree by the IMechE. While recognising this and the attendant difficulties that would be likely to arise from such a move, the Panel urged the Joint Board to consider whether the freedom to plan without the constraints imposed by accreditation might produce, on balance, a better degree.

- 7.1.4 Staff praised the high quality of many PDE students. The Panel recognised the particular efforts made by the Department with regard to support issues associated with less able students taking the degree.

8. Staffing Matters

8.1 Senior Staff and Teaching Management

- 8.1.1 The Panel noted that there appeared to be relatively limited involvement of professorial staff in teaching and its administration. Whilst it was acknowledged that commitment to research was essential, the Panel took the view that the Department should expect and encourage greater involvement of professorial staff in these areas of activity.
- 8.1.2 Staff the Panel met welcomed the introduction by the University of the new University Teacher and Senior University Teacher categories of staff, but noted also that present promotion criteria to the most senior levels were very research-oriented. This placed limitations on the careers of staff who dedicated themselves to a relatively considerable extent to their development as teachers.

8.2 Design Teaching

- 8.2.1 The Panel heard that, whilst the IMechE had praised the Department's design teaching, there were difficulties associated with this aspect of provision, in that it was difficult to obtain staff who had recent design experience but were also research-active. Design teaching also necessarily demanded considerable staff resources. To address this issue, the Department had decided to spread design teaching across larger numbers of staff. This coincided with growing interest in design aspects within mechanical engineering as a discipline.

8.3 Professional Recognition of Departmental Staff

- 8.3.1 The Panel commented on the relatively low level of professional recognition of staff by professional bodies, and suggested that it might be advantageous to improve the Department's profile in this regard. It was noted that, at the recent professional body visit, there had been no adverse comments on the proportion of staff who were members of the IMechE. The Department was presently recruiting two new staff; these were likely to be IMechE members. The Panel recommended that further consideration also be given to the practical benefits of increasing the proportion of staff who were professionally accredited.

8.4 Induction of Probationary Staff

- 8.4.1 The Panel commended the Department on its efforts in the induction and integration of the probationary lecturer whom it met. The Panel also complimented the Department in its success in welcoming and integrating female staff.

8.5 Honours Options

- 8.5.1 The Panel heard that the Department offered an average of 8-10 Honours options each year, with students taking 3 or 4. The Panel recommended that the Department review this position. In this regard, the Department might wish to reduce the number of options offered or impose a ceiling on numbers taking options.

8.6 *Graduate Teaching Assistants*

- 8.6.1 The Graduate Teaching Assistants who met the Panel confirmed that they had undertaken the necessary preliminary training before embarking on teaching/demonstrating activities. The Panel confirmed that GTAs were eligible to undertake a module within the University's Postgraduate Certificate in Higher Education. GTAs commented very positively on the support provided by the Department and on their early teaching experiences. Students the Panel met also strongly welcomed the involvement of GTAs in teaching, finding them approachable and appreciative of undergraduate needs.

9. **Physical Resources**

9.1 *Learning Resources*

- 9.1.1 Touring facilities, the Panel saw the Department's Unix cluster, which appeared old but adequate, and a PC cluster of 50+ machines. It was reported that the Department's practice was to replace 25% of these machines annually. This activity absorbed the Department's entire £20,000 equipment budget. Students spoke very positively about the Department's IT provision, and considered their situation favourable as compared with counterparts elsewhere. There was ready access to PCs and software, particularly for Computer Aided Design.
- 9.1.2 Students reported that there was adequate access to course materials in the Library; they had found that it was not strictly necessary to purchase set texts. Handouts were good, although a charge was applied.
- 9.1.3 There were reportedly limited electronic resources for teaching purposes. Staff and students reported that some blackboards were of poor quality.

9.2 *Accommodation*

- 9.2.1 Laboratories the Panel visited were of adequate but variable quality, with some basic or outmoded in appearance and in equipment levels. Staff voiced concerns that this could have a detrimental effect on recruitment. The Panel took the view that the Department should review whether accommodation and facilities for Materials teaching were fully adequate or required to be prioritised for improvement.
- 9.2.2 Staff expressed frustration at the level of amenity of lecture theatres. The Gregory Lecture Theatre was viewed as particularly poor, and the Panel undertook to recommend that its place in the schedule for refurbishment should be reviewed. While there had been a measure of improvement recently in some areas, there appeared to have been no consultation on user needs prior to refurbishment. The Panel undertook to ask the Vice-Principal (Estates) to confirm what level of preliminary consultation took place before such accommodation was modernised. Staff also raised with the Panel concerns that students were sometimes required to cross considerable distances across the campus between consecutive lectures or other classes. The Panel agreed to request that the Vice-Principal (Estates) considered whether means were available to improve the planning of teaching space allocation to reduce the extent of such movement between buildings.
- 9.2.3 Staff reported that there was a shortage of tutorial space, particularly in the James Watt Building. The Panel recommended that consideration be given to planning the use of such space on a Faculty-wide basis. This could include appropriate use of laboratories for tutorial purposes.

10. Conclusions

- 10.1 The Panel had been impressed by the quality of the documentation submitted by the Department for the DPTLA review. The impression created by the documents had been of a well organised and managed Department, and this had been borne out in the course of the various meetings. Overall, students had been very positive about their experiences; staff were clearly engaged with the development of teaching and learning in their discipline and well disposed to introducing improvements where possible in a difficult funding environment. The Head of Department was building positively on systems developed by his predecessor. There was much to commend, and the Panel's recommendations, set out in the following section, reflected that the Department's activities were generally working well.

10.2 Recommendations

The recommendations interspersed in the preceding report and summarised below are made in the spirit of encouragement to the Department of Mechanical Engineering to continue on its current path. The recommendations have been cross referenced to the paragraphs in the text of the report to which they refer.

The Panel identified the following recommendations:-

Student Matters

1. The Department should ensure that student feedback on teaching is shared with the Graduate Teaching Assistants (GTAs) and that GTAs should be encouraged to seek specific feedback on their own teaching. (*Paragraph 4.2.2*)

**Action: Head of Department;
Department;
GTAs**

2. The Department should ensure that there is representation from the GTAs on the Student/Staff Liaison Committee. (*Paragraph 4.2.2*)

**Action: Head of Department;
Department**

3. The Vice-Principal (Learning & Teaching) should relay to the Students' Representative Council (SRC) student concerns regarding the confrontational approach recommended to students at the SRC training event for class representatives. (*Paragraph 4.2.3*)

Action: Vice-Principal (Learning & Teaching)

4. The Department should review its means for communicating with students with a view to adopting a more systematic approach to reduce reliance on word-of-mouth. It is further recommended that the Department produces student handbooks in ring binders or a similar format to facilitate annual updating. (*Paragraph 4.2.4*)

**Action: Head of Department;
Department**

5. The Department should consider issuing answers to tutorial questions on web pages. (*Paragraph 4.2.4*)

Action: Department

6. The Department is encouraged, in conjunction with the Careers Service, to consider the introduction of structured advice on careers at an earlier stage in curricula than is presently the case. (*Paragraph 4.3.1*)

**Action: Head of Department;
Department**

Curriculum

7. The Department should consult with the Academic Regulations Committee on the issue of the Scottish Credit & Qualifications Framework vis-à-vis the possible introduction of an MSc in Sports Engineering. (*Paragraph 5.1.1*)

**Action: Head of Department;
Department**

8. The Department should give consideration to the introduction of further provision in micro/nano engineering. (*Paragraph 5.1.2*)

**Action: Head of Department;
Department**

Assessment

9. The University Assessment Working Group should review the statement contained within the University Calendar concerning student anonymity at Examination Boards with a view to clarifying the parameters within which anonymity should be preserved in discussion. (*Paragraph 6.3.1*)

Action: Vice-Principal (Learning & Teaching)

MEng/BEng in Product Design Engineering

10. The Product Design Engineering (PDE) Joint Board should review the credit rating for the Year 2 project. This review should take account of the impact of the project on students' work at the University. General consideration should be given to ensure that there is appropriate integration in the approach to all assessments between the two institutions. (*Paragraph 7.1.2*)

Action: PDE Joint Board

11. The Joint Board should review the position with regard to professional accreditation of the PDE degree. It should be considered whether the increased freedom to determine the curriculum that would entail would enable the degree to be, on balance, improved. (*Paragraph 7.1.3*)

Action: PDE Joint Board

Staffing Matters

12. The Department should expect and encourage greater involvement of professorial members of the Department in teaching and administration. (*Paragraph 8.1.1*)

**Action: Head of Department;
Senior Departmental staff**

13. The Department should examine the practical benefit of increasing the number of staff who are professionally accredited. (*Paragraph 8.3.1*)

**Action: Head of Department;
Department**

14. The Department should consider means for rationalising the provision of Honours options. In this regard, it might reduce the number of options offered or impose a ceiling on the numbers taking individual options. (*Paragraph 8.5.1*)

**Action: Head of Department;
Department**

Physical Resources

15. The Department should review whether accommodation and facilities for Materials teaching are fully adequate or require to be prioritised for improvement. (*Paragraph 9.2.1*)

**Action: Head of Department;
Department**

16. The Vice-Principal (Estates) should note concerns regarding the conditions in the Gregory Lecture Theatre and be asked to review its priority within the University's refurbishment programme. The Vice-Principal should also be requested to consider whether there is appropriate consultation with users in the planning of teaching space refurbishment. The Vice-Principal is also requested to consider whether means are available to improve the planning of teaching space allocation so that there might be a reduction in the extent to which students are required to move between buildings widespread across the campus during the teaching day. (*Paragraph 9.2.2*)

Action: Vice-Principal (Estates)

17. The Faculty should review whether it would be advantageous to adopt a Faculty-wide approach to the planning of tutorial space usage, including laboratory space. (*Paragraph 9.2.3*)

Action: Dean and Faculty of Engineering

Prepared by: Janet Anderton, Senate Office

Last modified on: Thursday 24 June 2004