

UNIVERSITY OF GLASGOW

Academic Regulations Committee - Friday 27 May 2005

**Departmental Programmes of Teaching, Learning and Assessment:
Report of the Review of Electronics and Electrical Engineering held
on Tuesday 19 April 2005**

Mrs Marjory Wright, Clerk to the Review Panel

July 2005

Panel Members:

Professor Robin Leake	Vice-Principal (Physical Sciences and Engineering) [Convener]
Professor D Vernon Morgan	University of Cardiff (External Subject Specialist)
Professor Bernard Weiss	University of Surrey (External Subject Specialist)
Professor Ray Welland	Member of Cognate Department (Computing Science)
Professor David Watt	Senate Assessor on Court
Dr Vicky Gunn	Teaching and Learning Service
Ms Helen Clegg	Senate Office
Mrs Marjory Wright	Senate Office

A. Introduction

- A.1 The Department of Electronics and Electrical Engineering is the largest of four Engineering Departments within the Faculty of Engineering.
- A.2 The Department is determinedly research-based, having achieved a 5 rating in the 2001 Research Assessment Exercise, and has a well-established international standing in the majority of its research areas.
- A.3 The Department had provided a Self-Evaluation Report (SER) and supporting documentation in accordance with the University's requirements for the Review of Departmental Programmes of Teaching, Learning and Assessment. The Review Panel found the SER helpful and congratulated the Department on the quality of the documentation that had been provided.
- A.4 The Review Panel found the Department to be well organised and was impressed with how it was performing. The Panel congratulated the Department on finding a means of optimising the Curriculum, to reduce the burden of teaching to two courses per member of academic staff.
- A.5 The Review Panel met with Professor John Hancock, the Dean of the Faculty of Engineering, the Head of Department, Professor John Arnold and with seven key members of the academic and administrative staff. The Panel also met with seven probationary members of staff, with six Graduate Teaching Assistants (GTAs) who represented hourly paid staff, with a group of nine undergraduate students representing all programmes, including the BEng with Music, and with four postgraduate taught students.

A.6 The Review Panel considered the following range of provision offered by the Department:

- MEng Degrees in:
 - Electronics and Electrical Engineering
 - Audio and Video Engineering
 - Microcomputer Systems Engineering
 - Electrical Power Engineering
 - Electronic and Software Engineering (with Computing Science)
 - Avionics (with Aerospace Engineering)
- MEng (European) Degrees in:
 - Electronics and Electrical Engineering
 - Audio and Video Engineering
 - Microcomputer Systems Engineering
 - Electrical Power Engineering
 - Electronic and Software Engineering (with Computing Science)
 - Avionics (with Aerospace Engineering)
 - Electronic Engineering and Physics (with Physics)
 - Electronics with Music (with Music)
- BEng Degrees in:
 - Electronics and Electrical Engineering
 - Audio and Video Engineering
 - Microcomputer Systems Engineering
 - Electrical Power Engineering
 - Electronic and Software Engineering (with Computing Science)
 - Avionics (with Aerospace Engineering)
 - Electronic Engineering and Physics (with Physics)
 - Electronics with Music (with Music)

All degrees are fully accredited by the Institution of Electrical Engineers (IEE).

B. Overall aims of the Department's provision

- B.1 The Review Panel was impressed with the broad spectrum of taught provision offered and found that the overall aims of the Department's teaching activities, as stated in the SER were met.
- B.2 The Department undertook a substantial amount of undergraduate teaching at both Faculty and cross-Faculty level and teaching and learning aims were met.
- B.3 All degrees were offered as both 4-year programmes (BEng) and 5-year programmes (MEng).
- B.4 The Review Panel noted from the SER that the Department aimed to turn its attention to the MSc course which was presently under resourced but was a potential source of a significant increase in student numbers if the correct formulation could be developed.

C.1 Undergraduate and Taught-Postgraduate Provision

C.1 Aims

The Review Panel found the Department's overall aims for the different programmes offered and specific aims for individual courses to be clear, informative and appropriate, and readily available to students through their inclusion in the

Departmental Undergraduate Student Handbook and in the Department's Course Information booklet.

C.2 Intended Learning Outcomes (ILOs)

- C.2.1 The Review Panel noted from the SER that the Department had produced Programme Specifications for the first time in Session 2004-05 and that the ILOs for each Degree programme were exactly aligned with the overall aims of provision.
- C.2.2 The Review Panel also noted that the ILOs for every Degree programme were listed in the Undergraduate Student Handbook and that ILOs for every course taught in the Department were communicated to students through the Course Documentation which was available to all students on the Departmental web-site and also distributed to students in the first meeting of the relevant course.

C.3 Assessment

- C.3.1 The Review Panel noted from the SER that the Department complied with the University Code of Assessment and that students were provided with a clear explanation of the grading system, including tables of the conversions between percentage marks, Grades and Aggregation Scores, in the Undergraduate Student Handbook.
- C.3.2 The Review Panel also noted from the SER that MSc taught courses were assessed by a 50:50 combination of formal examination and continuous assessment by means of marked assignment and laboratory work.
- C.3.3 The Review Panel heard of difficulties relating to the Department's experience of applying the Code of Assessment. Staff and External Examiners had found serious problems with the non linear conversion scale which created a "kink" at the top and bottom ends of the scale. The number of first class Honours achieved was found to be artificially depressed and the Board of Examiners had had to resort to using the discretionary band to award first class Honours to students who clearly merited it. The Panel will draw this to the attention of the Code of Assessment Working Group. The Panel explored the Department's views on normalisation of anomalous marks in individual courses, and ascertained that it was not in favour of this process, preferring to compensate in the Honours Board than on every course.
- C.3.4 Undergraduate students on the Electronics & Software Engineering programme told the Review Panel that Engineering examinations had clashed with computing lectures in Semester 1. The Panel was aware of the difficulties encountered in Joint Honours programmes as a result of the lack of a uniform policy among Faculties and **recommends** to the University that this be addressed. At a departmental level, the Panel **recommends** that care be taken to ensure that examination dates and teaching timetables for joint degrees are co-ordinated.

C.4 Curriculum Design and Content

- C.4.1 The Review Panel explored the role of the Curriculum Review Committee and noted that the Department had introduced the Committee to replace its Teaching Committee, which had ceased to be effective. The Curriculum Review Committee was led by the Head of Department and had been effective in implementing change. It was felt that the time was now right to delegate the convenership of this Committee.

- C.4.2 The Department has a balanced portfolio of undergraduate programmes and a broadly based taught MSc programme. In addition to single Honours degrees, joint degrees are offered in collaboration with the Departments of Music, Physics and Computing Science.
- C.4.2 During a tour of the Department's facilities, the Review Panel had the opportunity to view a 3rd year undergraduate team design project and a 4th year *Lego* robotics project and was impressed with the students' enthusiasm.
- C.4.3 Undergraduate students undertaking the joint degree with Music informed the Review Panel that studying an Arts discipline helped them to develop their research skills and essay writing skills.
- C.4.4 Undergraduate students were aware that the Engineering Career Skills 3 course had a purpose but felt that it had very little structure and that many of them missed the point of it. The Review Panel **recommends** that the Department review the course with a view to including more professional issues.
- C.4.5 Postgraduate students, the majority of whom were international students, liked the broad-based format of the MSc degree. The Panel was impressed that the Department had opted for this approach and had not been tempted to offer a specialised programme building on its research expertise.

C.5 *Student Recruitment, Support and Progression*

- C.5.1 The Review Panel **commends** the Department for its recruitment initiative in collaboration with the University of Strathclyde based on the initiatives of the Institution of Electrical Engineers, the Science Centre and the University's Department of Physics and Astronomy and **recommends** expansion in this area by the Faculties of Science and Engineering in conjunction with the Science and Engineering Faculties' Recruitment Committee.
- C.5.2 Both undergraduate and taught postgraduate students expressed general satisfaction with the support that they received from staff, and undergraduate students informed the Review Panel that staff responded when problems were raised with them.
- C.5.3 International students spoke highly of the Department. From discussions with Key Staff it was evident that the Department valued its students and that it worked closely with University Brunei Darussalam to ensure that students from Brunei, who follow an approved mirror of the first 2 years of the Glasgow curriculum, were sufficiently well prepared to integrate easily into the 3rd year of the curriculum in Glasgow. The Review Panel **commends** the Department on its integration of international students.
- C.5.4 Undergraduate students spoke warmly of the Department. They also spoke of their enjoyment of industrial placements abroad, and the opportunity that this gave them to be independent.
- C.5.5 The Review Panel heard that one 5th year student had experienced a lack of communication from the Department during her project placement in Europe. The Panel explored this thoroughly with Key Staff and although Panel members were satisfied that this was a rare experience, they **recommend** that the Department ensure that its existing protocol in relation to project placements abroad is documented and observed in practice.
- C.5.6 The Review Panel noted from the SER and from discussions with staff that the BEng Electronics with Music degree experiences strong demand regularly and could almost certainly accommodate larger numbers with reliable entry

rates if the cap of 25, which is there on account of the resource limitations that prevail in the Department of Music, could be removed. However, it was acknowledged that, at present, this was not a realistic option. Discussions **are recommended** with the Department of Music to explore what resources would be required to enable an expansion of the intake to the BEng Electronics with Music to be considered and whether this could be justified on an academic and financial basis.

- C.5.7 BEng Electronics with Music students told the Panel that they did not feel well integrated into the Department of Music and questioned the effectiveness of the communication between the two Departments. Following discussion with Key Staff and with the Head of Department, the Review Panel was assured that no real problem existed. It appeared that the students' perception of communication difficulties might have arisen as a result of the recent maternity leave of the link member of staff in the Department of Music. The Panel was aware that the approach to examinations can differ between an Arts & a Science/Engineering Department. To avoid any future misunderstandings the Panel **recommends** that a meeting take place between the Convener of the Review Panel and the Heads of both Departments to consider ways of enhancing student awareness of communication channels and to help students to feel part of both departments.
- C.5.8 The Review Panel explored the retention difficulties in years 1 and 2 of the undergraduate programmes with the staff and Graduate Teaching Assistants (GTAs) and noted that staff put a great deal of effort into trying to communicate with students who had poor attendance at practicals and tutorials. Despite this, some students simply disappeared from their programme of study leaving no contact address. The Panel appreciated that this was a general problem in the Faculties of Science and Engineering and not unique to Electronics and Electrical Engineering but **recommends** that the Department, and the relevant Faculty Committees, continue to explore the reasons for the high drop-out rate and ascertain whether there is any correlation with academic performance to date.
- C.5.9 The Department is currently rated 4th overall in the *Guardian* review of Engineering departments. However, other statistics relating to the Department in the same report are misleading and the Review Panel therefore **recommends** that the University consider how it communicates its statistics to the Press.

C.6 *The Effectiveness of Provision*

- C.6.1 Both undergraduate and taught postgraduate students expressed general satisfaction with the standard of provision offered by the Department.
- C.6.2 Postgraduate students found the courses to be well balanced but would have liked more opportunities for practical work in the optical courses. The Review Panel **recommends** that the Department consider this request.
- C.6.3 Postgraduate students reported that laboratories were well equipped and always open.
- C.6.4 Postgraduate students perceived Library facilities to be good and found the on-line access available from the Department to be very helpful during assignments and projects.
- C.6.5 International students found language support in the University to be good with courses and presentations also available to support writing. Their greatest challenge had been attuning their ear to the Scots dialects.

- C.6.6 The Review Panel noted that there appeared to have been a late withdrawal of certain MSc courses and that students only found out on arrival that they were not available. The Panel was advised that these had been withdrawn some time ago but still required to be removed from the course literature. The Panel **recommends** that the Department's course literature for applicants and its website be updated as a matter of urgency.
- C.6.7 The Review Panel was pleased to note that, in addition to the training provided by the Teaching and Learning Service, Graduate Teaching Assistants (GTAs) had received generic training from the Faculty. GTAs had found that teaching students was a very useful experience and reported that the occasions when they had to rethink their approach to ensure clarity for students also helped them to develop their research and transferable skills.

D The Maintenance and Enhancement of Standards of Awards

- D.1 All degrees offered by the Department are fully accredited by the Institution of Electrical Engineers (IEE), which has a robust process of inspection and follow-up.
- D.2 The Review Panel noted from the SER that the Curriculum Review Committee (see also C.4.1) was engaged in a rolling programme of review of the Department's provision in the context of its relevance and coherence.
- D.3 There was clear evidence from the documentation provided that the Department engaged effectively with its External Examiners.
- D.4 The Review Panel had concerns about the poor mathematics skills amongst University entrants in general and **strongly commends** the Department for the efforts that it had put into improving the mathematics skills of Engineering students in recent years, although it had not been possible to sustain this in the current academic session.

E. The Maintenance and Assurance of Quality

- E.1 The Department had a Staff-Student Committee, which was a highly-valued method of achieving direct feedback from students in an environment where discussion and exchange of views can take place.
- E.2 The Department **demonstrated good practice** in its robust process of annual review of its programmes and is to be complimented on the bound report that it prepared in relation to this each year.
- E.3 The Department **demonstrated good practice** in collecting extensive feedback at the end of each course and in its diligent analysis of the information. The SER indicated that the Department had some reservations about the effectiveness of the student questionnaires for a number of reasons and there did not appear to be a robust mechanism for providing feedback to students. The Review Panel **recommends** that the Department develop a robust means of communicating to students the action taken as a result of analysing the feedback that they provide.
- E.4 The Review Panel noted that the Department had recently disbanded its Industrial Liaison Committee, whose function had been to report on aspects relating to the relevance of the courses and in particular on the logistics and relevance of MEng projects. The Panel **recommends** that the Industrial Liaison Committee be reinstated with a more strategic remit that would be more interesting to industrialists.
- E.5 Probationary Lecturers informed the Review Panel that the Department provided appropriate support to help them to establish their teaching and research. Their workload was appropriately balanced and their targets realistic. All had the support

of a Departmental mentor. Although they benefited from having an end-of-year review they also felt that it would be beneficial for them to have an opportunity to feed back their experience to staff at the end of their third year. The Panel **recommends** that the Department consider the introduction of a mechanism to facilitate this.

- E.6 Probationary Lecturers also felt that they would benefit from expert advice and training in the preparation of research grant applications and the Panel **suggests** that the Department consider how this might be addressed, in conjunction with existing Faculty and University provision in this area.

F. Enhancing the Student Learning Experience

- F.1 There was evidence that the student learning experience was enhanced as a result of the learning taking place in a strong research environment.
- F.2 The Department **demonstrated good practice** with the arrangements that it had put in place to ensure that all students saw their Adviser at the beginning of the academic year, a process that should be adopted more generally.
- F.3 The Department **demonstrated good practice** in operating a successful mentorship programme for first year undergraduate students. GTAs described the scheme to the Panel and reported that it was a means of passing on experience to groups. It was primarily social and provided new students with the opportunity to mix with others but, in so doing, aided their academic development.
- F.4 Undergraduate students reported that tutorials with GTAs were well attended, and helped them to develop self esteem and the confidence to ask questions.
- F.5 Undergraduate students complained about the amount of time they spent moving around the campus between lectures, which were often distant from each other. Staff also expressed concern about this and the Review Panel **recommends** that Central Room Bookings take appropriate steps to ensure that student movement around the campus for lectures is kept to a minimum.
- F.6 Undergraduate students were frank with the Review Panel about how they envisaged that current provision might be enhanced. They requested access to computing facilities in the Department outside the hours of 9.00 am to 5.00 pm and during the Easter vacation period. The Panel appreciated that this would be difficult to provide, for both security and health and safety reasons, but **recommends**, as a compromise, that the Department undertake a trial period of extended student access to computing facilities. The Panel suggests that the Department permits access until 6.00 pm for a period of 3 weeks and until 8.00 pm for a further period of 3 weeks and that an evaluation of the uptake by students be undertaken to determine the extent of interest in such provision.
- F.7 Postgraduate taught students advised the Review Panel that they would benefit from having supervised laboratories. The Panel **recommends** that the Department give consideration to this request and the implicit need to give postgraduate taught students the same training in laboratory management as research students, both from a safety and education point of view.
- F.8 The Review Panel appreciated the difficulties that the Department encountered with ageing laboratories and out-of-date equipment. This matter has been passed to the Learning and Teaching Infrastructure Fund Committee.
- F.9 The Department has a well-equipped computer cluster with parallel connections and has recently started using Moodle, the University's interactive on-line facility, to assist student learning. The Review Panel **recommends** that the Department contact

Glasgow University Initiative in Distance Education (GUIDE) for support and advice to help it expand its use of Moodle.

- F.10 The Review Panel viewed the current laboratory refurbishment that the Department was able to undertake as a result of its successful research activity and noted that students would have spin-off benefits from these developments. However the Panel was aware that further investment in the undergraduate teaching laboratories was still needed.

G. Summary of Key Strengths and Areas to be Improved or Enhanced in relation to Learning and Teaching and Conclusions and Recommendations

Key strengths

- The Department demonstrates good practice by making Course Documentation available to students by means of the Departmental website.
- The broad-based format of the MSc degree offered by the Department is attractive to international students.
- The Department is commended for its recruitment initiative in collaboration with the University of Strathclyde, which introduces late primary and early secondary school pupils to the subject area.
- The Department is commended on its integration of international students
- The Department is strongly commended for the efforts that it has put into improving the mathematics skills of Engineering students in recent years.
- The Department demonstrates good practice in its robust process of annual review of its programmes and is complimented on the bound report that it prepares in relation to this each year.
- The Department demonstrates good practice in collecting extensive feedback at the end of each course and in its diligent analysis of the information.
- The Department demonstrates good practice in operating a successful mentorship programme for first year undergraduate students.
- The Department is complimented on the success of its Graduate Teaching Assistant led tutorials, which helped undergraduate students to develop self-esteem and the confidence to ask questions.
- The Department has a well-equipped computer cluster for student use.
- Students are satisfied with the Department's provision and the level of support that they receive from staff.
- The Department is to be congratulated on finding a means of optimising the Curriculum, to reduce the burden of teaching to two courses per member of academic staff.

Areas to be improved or enhanced

- Further investment in the undergraduate teaching laboratories is needed. This matter has been passed to the Learning and Teaching Infrastructure Fund Committee.
- The Head of Department has recently set up a Curriculum Review Committee, which has been successful in implementing change. The Review Panel feels that the time is now right to delegate the convenership of this Committee.

- The Review Panel suggests that the Department consider how expert advice and training on the preparation of research grant applications might be made available to Probationary Lecturers in conjunction with existing Faculty and University provision in this area.
- The Department is encouraged to expand its use of Moodle.
- The Department is required to formalise its procedures in relation to support for students undertaking a project abroad
- The Industrial Liaison Committee should be reinstated.

Conclusions and Recommendations

Conclusions

The Review Panel commended the Department highly on the overall quality of its provision. Members of staff were found to be enthusiastic, committed and responsive to change. Probationary Lecturers were provided with the appropriate support to allow them to establish their teaching and research and Graduate Teaching Assistants found personal value in the teaching contribution that they made to the Department.

Students spoke warmly of the Department. There was an innovative mentorship scheme in place to support first year students and the Panel was impressed with the level of integration of international students into the Department.

The Department has undergone effective change under the current Head of Department. The Review Panel was concerned by the amount of work undertaken by the Head of Department and **recommends** that the Dean review the workload attached to the Headship bearing in mind the fixed term nature of the role and the need to be research active in such a high quality Department.

The Review Panel wishes to draw to the attention of the Code of Assessment Working Group that the Department of Electronics and Electrical Engineering had found serious problems with the non linear conversion scale when applying the Code of Assessment.

The recent Departmental Review of Teaching, Learning and Assessment of the Department of Music (4 March 2005) regretted the lack of opportunity to meet with BEng students undertaking the joint degree in Electronics with Music. The Review Panel therefore requests that the sections of this report that refer to the joint degree with Music be drawn to the attention of the Convener and Panel members of the Department of Music Review, and to the Head of Department of Music (C5.6, C5.7).

Recommendations to the Department/Faculty

Recommendation 1:

The Panel recommends that care be taken to ensure that examination dates and teaching timetables for joint degrees are co-ordinated. *Paragraph C.3.4)*

Action: The Head of Department

Recommendation 2:

The Panel recommends that the Department review the Engineering Career Skills 3 course with a view to including more professional issues. *(Paragraph C.4.4)*

Action: The Head of Department

Recommendation 3:

The Panel recommends that the Department ensure that its existing protocol in relation to project placements abroad is documented and observed in practice. (*Paragraph C.5.5*)

Action: The Head of Department

Recommendation 4:

The Panel recommends discussions with the Department of Music to explore what resources would be required to enable an expansion of the intake to the BEng Electronics with Music to be considered and whether this could be justified on an academic and financial basis. (*Paragraph C.5.6*)

Action: The Head of Department

Recommendation 5:

The Panel recommends that the Department continue to explore the reasons for the high drop-out rate in years 1 and 2 of the undergraduate programmes and ascertain whether there is any correlation with academic performance to date. (*Paragraph C.5.8*)

Action: The Head of Department

Recommendation 6:

The Panel recommends that the Department consider providing Postgraduate students with more opportunities for practical work in the optical courses. (*Paragraph C.6.2*)

Action: The Head of Department

Recommendation 7:

The Panel recommends that the Department's course literature for applicants and its website be updated as a matter of urgency. (*Paragraph C.6.6*)

Action: The Head of Department

Recommendation 8:

The Panel recommends that the Department develop a robust means of communicating to students the action taken as a result of analysing the feedback that they provide. (*Paragraph E.3*)

Action: The Head of Department

Recommendation 9:

The Panel recommends that the Department's Industrial Liaison Committee be reinstated with a more strategic remit that would be more interesting to industrialists. (*Paragraph E.4*)

Action: The Head of Department

Recommendation 10:

The Panel recommends that the Department consider the introduction of a mechanism to provide Probationary Lecturers with an opportunity to feed back their experience to staff at the end of their third year of probation. (*Paragraph E.5*)

Action: The Head of Department

Recommendation 11:

The Panel recommends that the Department undertake a trial period of extended student access to computing facilities and suggests that the Department permits access until 6.00 pm for a period of 3 weeks and until 8.00 pm for a further period of 3 weeks and that an evaluation of the uptake by students be undertaken to determine the extent of interest in such provision. (*Paragraph F.6*)

Action: The Head of Department

Recommendation 12:

The Panel recommends that the Department give consideration to providing supervised laboratories for Postgraduate taught students and the implicit need to give postgraduate taught students the same training in laboratory management as research students, both from a safety and education point of view. (*Paragraph F.7*)

Action: The Head of Department

Recommendation 13:

The Panel recommends that the Department contact GUIDE for support and advice to help it expand its use of Moodle. (*Paragraph F.9*)

Action: The Head of Department

Recommendation 14:

The Panel **recommends** that the Dean review the workload attached to the Headship of the Department of Electronics and Electrical Engineering bearing in mind the fixed term nature of the role and the need to be research active in such a high quality Department. (*Conclusions, Paragraph 3*)

Action: The Dean of the Faculty of Engineering

Recommendations to the University

Recommendation 15:

The Panel recommends that the University address the lack of a uniform policy among Faculties in relation to the timing of examinations and teaching, which creates difficulties for Joint Honours programmes. (*Paragraph C.3.4*)

Action: The Vice Principal for Teaching and Learning

Recommendation 16:

The Panel **recommends** expansion of the existing collaborative recruitment initiative with the University of Strathclyde, in conjunction with the Science and Engineering Faculties' Recruitment Committee. (*Paragraph C.5.1*)

Action: The Deans of the Faculties of Science and Engineering

Recommendation 17:

In relation to the BEng Electronics with Music degree, the Panel recommends that a meeting take place between the Convener of the Review Panel and the Heads of both Departments to consider ways of enhancing student awareness of communication channels and to help students to feel part of both departments. (*Paragraph C.5.7*)

Action: The Convener of the Review Panel

Recommendation 18:

The Panel recommends that the relevant committees in the Faculties of Science and Engineering explore the reasons for the high drop-out rate in years 1 and 2 of undergraduate programmes. (*Paragraph C.5.8*)

Action: The Deans of the Faculties of Science and Engineering

Recommendation 19:

The Panel recommends that the University consider how it communicates its statistics to the Press. (*Paragraph C.5.9*)

Action: The Director of Planning

Recommendation 20:

The Panel recommends that Central Room Bookings take appropriate steps to ensure that student movement around the campus for lectures is kept to a minimum. (*Paragraph F.5*)

Action: The Director of Estates & Buildings

Prepared by: Janet Fleming, Senate Office

Last modified on: Friday 17 June 2005