University of Aberdeen

**Internal teaching review**

**SCHOOL OF ENGINEERING**

**(formerly the Department of Engineering, School of Engineering and Physical Sciences)**

**Summary + response**

This document includes:

* an extract from the full report on the internal teaching review of the then Department of Engineering carried out in December 2006 and March 2007. It includes the Panel’s **overall impressions** of the provision, a record of the Panel’s **commendations** and **recommendations**, and a list of the programmes which were revalidated;
* responses from the School of Engineering (in italic type).

**1 Overall impressions**

The Panel noted that the Department of Engineering provided committed and professional teaching for its students across a range of degree programmes. It was clear that technical, administrative and secretarial staff were committed to their roles and shared with their academic colleagues a strong wish to provide high levels of academic and pastoral support to students. The Panel was impressed by the very good learning experience offered by the undergraduate degree programmes. Although the MEng, BEng and BScEng encompassed a wide range of student ability, the Department had carefully structured years 1 and 2 to be common to all of them. Students received a two-year foundation in general engineering skills and were able to defer the point at which decisions about specialisation had to be made, features they clearly valued. The introduction in recent years of an induction week for year 1 undergraduate students together with small group working in year 1 across the range of programmes and student abilities was planned to benefit students by enhancing both academic and personal integration as early as possible. It was noted that staff took care to monitor group performance with a view to reassigning members if particular groupings did not work well. Early signs indicated that the year 1 changes were enjoyed by students although the Department acknowledged that, as yet, there had been no resultant improvement in retention rates. The Panel noted that the Department, the School of Engineering and Physical Sciences, and the College of Physical Sciences were concerned about retention and progression rates, and were seeking to find ways of enhancing performance in both areas.

The Panel shared student satisfaction with innovative teaching and assessment methods such as the nine-week design project in year 3 of Civil Engineering. Similarly, the open-book assessment in the same programme and year reinforced to students realistic and safe working methods for use in later professional life. The Panel were impressed with the ‘outward bound’ course offered at the start of MEng year 5 which offered team-building skills, leadership skills, and help with job seeking techniques.

The Panel encouraged Engineering to review the workload and extent of challenge offered to undergraduate students within and between years. While years 1 and 2 being common to all three undergraduate programmes was clearly commendable, some students found year 2 insufficiently challenging while others found the transition between years 2 and 3 difficult to cope with. The Panel also recommended that greater care be taken to make clear to MEng year 5 students the purpose and benefits of advanced topics. Students found it difficult to understand the relevance of work that appeared to be unrelated to the main area of degree specialisation.

It was clear, both from staff and some students, that Engineering took seriously the role of students in monitoring programme and course provision. Two members of academic staff had introduced a system of mid-course monitoring and a third was planning to include class representatives in end-of-course review meetings. Another member of academic staff was enthusiastic about the benefits of using PRS. However, the Panel considered that the Department needed to improve the management of the SCEF exercise and was reassured to learn from Professor Deans that steps were being taken to ensure that this was being done. There was also a need to improve the clarity and speed with which students were told what changes had, or had not, been made in response to the SCEF exercise or feedback from class representatives, though it was noted that the Department was endeavouring to do so. A student representative had been included on the Engineering Undergraduate Teaching Committee from the start of academic year 2006/7. Both the Department of Engineering and the School of Engineering and Physical Sciences were encouraged to consider other ways in which student participation in quality assurance could be enhanced.

While postgraduate students were broadly satisfied with provision, it was clear that the link between academic theory and industrial practice was not always sufficiently explicit in postgraduate taught programmes. Research students who started at times other than the beginning of the academic year should be offered induction when they began their studies, rather than in the following October.

The Panel noted a significant degree of tension between teaching and research in the way in which teaching duties were assigned. There were clear discrepancies between the teaching loads carried by different members of academic staff with some carrying an excessive teaching load.

The Panel judged that the Department should introduce rolling programmes to replace teaching laboratory equipment to ensure that the equipment used by students was up-to-date and sufficiently plentiful to give all students adequate hands-on experience. Similarly, a rolling programme should be adopted to update specialised software packages and to increase the number of licences so that all students who needed to could gain adequate experience in using them.

Greater consideration needed to be given both inside and outside the Department to marketing and recruitment. It was clear that some Engineering undergraduates were not aware of the range of postgraduate provision available within their own Department. Equally, a recent successful recruitment drive undertaken by the Student Recruitment and Admissions Service (SRAS) had caused significant problems within Engineering because SRAS appeared not to have ascertained whether there would be adequate resource to support the students recruited.

***SCHOOL OF ENGINEERING: Response to the Engineering ITR Report***

1. *General commentary*

*The School welcomes the final report of the ITR panel and wishes to record its gratitude to the panel for its careful and thoughtful deliberations during the ITR process. Particularly pleasing was the view of the panel that Engineering provided committed and professional teaching with a good learning experience offered by the undergraduate degree programmes. Allied to this was the view that academic, secretarial and technical staff had a strong wish to provide high levels of academic and pastoral support to students.*

*The ITR has provided the School with an opportunity to reflect on many aspects of its teaching provision and these are alluded to in the recommendations stemming from the ITR report. Preparation of an action plan to respond to these recommendations will allow the School to move forward in a measured and organised manner, taking into account key points for improvement in overall performance.*

*A number of specific issues of good practice were identified, such as the induction programme delivered to new Level 1 students. This has been disseminated within the college and the practice has been adopted more widely at the beginning of the current academic year. In addition, the concept operated by the Civil Engineering group for Design teaching at Level 3 has now been adopted by the Mechanical Group.*

1. *Action plan*

*An Action Plan is attached and is laid out according to the recommendations provided in the Summary Report and indicates what proposals are intended and, where possible, timescales.* [Note: the School’s responses are given in italic type in section 3 below immediately following each recommendation/group of recommendations.]

*A number of items for recommendation have already been identified and action commenced and items that have already been closed out are also highlighted.*

*Additional items for discussion outwith the School are also included and these will be raised as a matter of priority.*

**2 Commendable features**

[Numbers in round brackets refer to the relevant paragraph of the Panel’s full report.]

The Panel commended the following aspects of the Department’s provision.

2.1 the range of undergraduate provision, both across and within the three degree programmes, and the very good learning experience offered by the three programmes, MEng, BEng and BScEng;

2.2 the clarity with which they distinguished between the objectives of the MEng and BEng, which in many regards are very similar programmes (2.1);

2.3 the way in which Engineering had designed years 1 and 2 to be common to all three undergraduate programmes, ensuring as far as possible that students in the different programmes were integrated into one body. The achievement was considerable, not least given the considerable ability range across undergraduate students (5.1);

2.4 the way in which the Department had designed years 1 and 2 so that students received a two-year foundation in general engineering skills and were able to defer the point at which decisions about specialisation had to be made, features they clearly valued (5.1);

2.5 the positive and pro-active approach of teaching staff (6.1);

2.6 the introduction in recent years of an induction week for year 1 undergraduate students, designed to enhance both academic and personal integration as early as possible by introducing students to their advisers of studies, to the small groups in which they would work both in tutorials and labs, and more broadly to Engineering as a discipline and to the University (6.2);

2.7 the use of a nine-week design laboratory in year 3 of Civil Engineering which enabled students to work on a problem at greater length and depth, a feature attractive both to students and to the industries in which they would later be employed (6.3)

2.8 the introduction of open-book assessment in year 3 of Civil Engineering, a development intended to help students realise the importance of constant referencing to source materials in professional practice (6.3);

2.9 the scheme used in years 4 and 5 of Civil Engineering whereby people from industry mentored small groups of students at a series of meetings held during the academic year, some of them at industrial sites. Students benefited by developing a realistic view of the expectations of industry and the industrial contacts were reported as being equally positive about the benefits of the scheme (6.5);

2.10 good industrial feedback to students at undergraduate level (6.5);

2.11 the use of the week-long ‘outward bound’ course at the start of the MEng year 5 to encourage the students to enhance their interpersonal abilities, to develop teamwork, business skills and entrepreneurship, and to improve their job-seeking skills. It was valued by MEng students, and was highly regarded both by the Engineering professional bodies and by the Department’s external examiners (6.6);

2.12 the care taken by Engineering to ensuring that students developed a good range of transferable skills (6.8);

2.13 the successful use of WebCT in the MSc in Project Management (6.10);

2.14 the use in certain undergraduate courses of mid-course monitoring in addition to the standard SCEF end-of-course exercise (7.2);

2.15 the development of an on-line alternative to the University’s SCEF form for the MSc in Project Management in order to improve rates of feedback from students, given that the standard SCEF exercise was not well-suited to the needs of students many of whom participated by distance learning (7.2);

2.16 the use of PRS in certain courses to gain immediate student feedback, a feature found useful by staff (7.3)

2.17 the great importance placed by Engineering on enhancing students’ employability by developing students’ transferable skills within the design of individual courses, by involving the Careers Service and visiting lecturers in course delivery, by encouraging industrial placements where possible and by the use of an innovative ‘outward bound’ week for year 5 MEng students (9.1);

2.18 the seriousness with which Engineering treated the contribution of student representatives (12.1);

2.19 the way in which Engineering had put in place means of supporting students on the MSc in Project Management, many of whom participated via distance learning (13.3);

**3 Recommendations**

[Note: The ITR visit was undertaken while Engineering was a part of the School of Engineering and Physical Sciences. The responses to the ITR Panel’s recommendations (in italic type below followed by the date of implemenation) were received from the School of Engineering.]

The Panel recommended that the Department of Engineering:

***Staffing***

[*Note by Clerk:* At the time of the ITR visit, points 3.2 and 3.3 below were also identified for consideration within the then School of Engineering and Physical Sciences.]

3.1 continue to reduce dependence on bought-in teaching (3.1);

*HoS to remove this for core teaching. Academic year 2008/09.*

3.2 consider the wide disparities in teaching loads between members of academic staff with a view to reducing them where possible (3.2 and 18.1);

*HoS has set up a small working group to consider the issue and develop a workload model. Report during early 2008.*

3.3 use a workload model in managing teaching loads (3.2 and 18.1);

*Implement outcome of working group. Academic year 2008/09.*

3.4 aim to reduce staff-student ratios to improve the learning experience for students (3.3);

*HoS to discuss with HoC. 2007/08.*

***Departmental organisation***

3.5 review the distribution of administrative responsibilities to ensure that such tasks were shared appropriately to ensure that no one individual was overloaded (4.1);

*HoS to review administrative duties in light of workload model outcomes and implement. Academic year 2008/09.*

***Course and programme design, accessibility and approval***

3.6 consider student workload both within and between successive years in degree programmes (5.2);

3.7 review how to challenge able students more in year 2 of undergraduate programmes (5.2);

3.8 consider using open-ended problems in year 2 for able students, though it was noted that, in order to do so, a greater range of laboratory equipment would be needed than was currently available (5.2);

*[3.6, 3.7 & 3.8] HoS has tasked the 3 professional groups to consider these matters and report to the Engineering Undergraduate Teaching Committee. Early 2008.*

3.9 develop a BScEng programme specifically for entrants whose need for discipline-specific and English language support was greater than could readily be accommodated within the established BScEng programme (5.4);

*A set of new Engineering courses have been developed for this purpose and the appropriate changes to the degree regulations made. HoS to discuss staffing requirements for possible implementation and provision of English language support. Early 2008.*

3.10 increase industrial involvement in the MSc in Safety Engineering and Risk Management (5.5);

*HoS has initiated discussion with the programme coordinator. 2007/08.*

3.11 review taught postgraduate programmes to ensure that the way in which theoretical concepts were applied in industrial contexts was made sufficiently explicit. (5.5);

*HoS has initiated a review with the programme coordinators. 2007/08.*

3.12 review how management teaching was provided, not least to ensure that there was not an over-dependence on visiting lecturers for its provision (5.6);

*HoS has discussed with the HoC and formulated a proposal for part-time Management post. 2008.*

***Teaching, learning and assessment***

3.13 monitor innovative teaching methods used in certain courses with a view to rolling out their use more widely if appropriate (6.1);

*HoS has requested professional groups to consider these and possible implementation in other courses. 2008.*

3.14 take care to ensure that MEng year 5 students understood why and how the year 5 advanced topics were relevant to the students’ overall programme and career aspirations (6.7);

*HoS has asked the Engineering Undergraduate Teaching Committee to review the learning outcomes and, in this light, the course coordinator to review the course information document. Academic year 2008/09.*

3.15 generally make more use of IT in teaching (6.10);

*HoS has requested staff to consider making more use of WebCT for teaching and to consider using PRS. Laptop initiative is also providing opportunity to explore this further with CLT. 2007/08.*

3.16 review the space available for student learning, especially given the likelihood of greater use of group working, commended elsewhere in the report (6.13);

*Completion of the Fraser Noble refurbishment will provide scope for this. 2008/09.*

***Course and programme monitoring and review***

3.17 ensure that all students were able to complete SCEF forms in conditions which guaranteed anonymity and that the forms for each course were gathered by a member of staff not involved in the teaching of it (7.1);

*HoS has ensured that the practice of collecting SCEFs by the course teacher (a single case) is discontinued. Forms are either collected by SSLC student representative or returned directly to the School office. 2007.*

3.18 put in place measures to improve SCEF response rates (7.1);

*Issue has been discussed at the autumn meeting of the Engineering SSLC and discussion with the student body is ongoing to identify suitable measures. 2007/08.*

3.19 improve feedback to students about what changes were or were not made in response to student feedback (7.4);

*HoS will initiate further discussion with student representatives on the most appropriate ways of providing timeous feedback. 2007.*

3.20 consider ensuring that suitable induction was offered to all new research students when they arrived and not only at the start of each academic year (8.1);

*HoS has asked the PG Research Coordinator to examine the possibility of offering this facility. 2007.*

***Training and supervision of research students***

3.21 provide better links on the Engineering web pages between different categories of guidance for postgraduate students (8.1);

*New School website will take account of this issue. 2008.*

***Staff training and educational development***

3.22 ensure that appropriate training and support was made available to members of permanent and visiting staff to encourage them to enhance the range of teaching methods used on taught postgraduate programmes (11.1);

*HoS will, in discussion with visiting staff and CTL, consider the most appropriate ways of providing training. 2008.*

3.23 give visiting lecturers better training and support to enable them to become familiar with University practice regarding assessment and academic standards (11.2);

*HoS will discuss with the programme coordinators and provide support material and induction. 2008.*

***Student involvement in quality processes***

3.24 increase the role of students in quality processes (12.2);

*A student member of the SSLC has been elected to serve on the Engineering Undergraduate Teaching Committee and a member will be elected to attend School staff meetings. 2007.*

***Student retention and progression***

3.25 make greater and more refined use of available statistical information to monitor retention and progression (13.1);

*Formation of the School has improved the availability of and access to statistics and affords opportunity to use these more intelligently. HoS will ensure that analysis is completed routinely year on year. 2008.*

***Recruitment, access and widening participation***

3.26 review how all their programmes are advertised in light of the difficulty experienced by prospective students, both in the UK and in other countries, when trying to find out about Engineering programmes at Aberdeen (14.1);

*HoS will discuss with SRAS and also ensure that the new website makes programme information more visible. 2008.*

3.27 consider how to enable non-Engineering students to take Engineering courses as part of other degree programmes offered by the University (14.3);

*Timetabling and pre-requisites make this difficult but the issue will be explored by the Engineering Undergraduate Teaching Committee. 2008.*

***Quality enhancement and good practice***

3.28 increase the use of workshops and a College Bulletin provided by the College of Physical Sciences to disseminate good practice (15.1);

*Every opportunity to utilise these will be considered and discussed with the College DOTL. 2008.*

***Matters to be taken up outside Engineering***

[*Note by Clerk:* Points 3.29-3.32 inclusive will now be for consideration by the School of Engineering and the College of Physical Sciences.]

3.29 The Panel **recommended** that the School of Engineering and Physical Sciences and the College of Physical Sciences review levels of technical staff to ensure that sufficient personnel were available to ensure that all students gained enough hands-on experience operating equipment. The Panel considered that a diminution in numbers of technicians in recent years had had an adverse effect on student laboratory work (see *Teaching, learning and assessment 6.11* above) (3.4, 18.3, 19.2).

*HoS to raise and discuss with the HoC. 2007/08.*

3.30 The Panel **recommended** that the School of Engineering and Physical Sciences and the College of Physical Sciences review teaching resource as a matter of priority, in consultation with the College, to ensure that students did not continue to be adversely affected by a recent marked increase in recruitment of students to year 3 of the BScEng (6.4, 18.2, 19.1).

*HoS to raise and discuss with the HoC. 2007/08.*

3.31 The Panel **recommended** that the School of Engineering and Physical Sciences and the College of Physical Sciences review equipment provision with a view to ensuring that it was adequate for the programmes being provided (3.4, 19.2).

*HoS to review equipment needs and raise and discuss with HoC. 2008.*

3.32 The Panel **recommended** that the School of Engineering and Physical Sciences and the College of Physical Sciences introduce a rolling programme to ensure that specialised software used by students was kept up-to-date and that a sufficient number of copies was made available to facilitate hands-on use by all students (6.12, 19.2).

*HoS to review requirements and to raise and discuss with the HoC. 2008.*

***Matters to be taken up outwith the College***

3.33 The Panel **recommended** that there be consultation between SRAS and departments/schools to clarify how increases in recruitment in targeted areas would impact on the academic area concerned before such recruitment was undertaken (14.2).

*HoS to make HoC aware of the issue and inform SRAS. 2007/08.*

3.34 The Panel **recommended** that SRAS improve response times to student applications to try to enhance acceptance rates (20.1).

*HoS to make HoC aware of the issue and inform SRAS. 2007/08.*

3.35 The Panel **recommended** that priority be given to improving the standard of applicants in order to avoid or reduce problems caused by levels of language and technical skills which were less good than was customary (20.2).

*HoS to make HoC aware of the issue and inform SRAS. 2007/08.*

**4 Revalidation of programmes**

4.1 The Panel revalidated the following programmes:

| Programme Title | **Programme Code** |
| --- | --- |
|  |  |
| Master of Engineering |  |
| Civil Engineering | 07H20554 |
| Civil Engineering and Diploma in Management | 07H20854 |
| Civil and Structural Engineering | 07H22554 |
| Civil and Structural Engineering with European Studies | 07H22654 |
| Civil and Environmental Engineering | 07H25554 |
| Civil and Environmental Engineering with European Studies | 07H25654 |
| Mechanical Engineering | 07H30554 |
| Mechanical Engineering and Diploma in Management | 07H30854 |
| Mechanical Engineering with European Studies | 07H30654 |
| Mechanical and Electrical Engineering | 07HH3M54 |
| Mechanical Engineering with Control | 07H3HP54 |
| Mechanical Engineering with Materials | 07H3JM54 |
| Electrical and Electronic Engineering | 07H50554 |
| Electrical and Electronic Engineering and Diploma in Management | 07H50854 |
| Electrical and Electronic Engineering with European Studies | 07H50654 |
| Electronic Engineering with Communications | 07H62554 |
| Electrical and Electronic Engineering with Control | 07H64554 |
| Electronic and Computer Engineering | 07H6GP54 |
|  |  |
| **Bachelor of Engineering** |  |
| Engineering (Civil) | 07H20052 |
| Engineering (Civil with European Studies) | 07H20252 |
| Engineering (Civil and Structural) | 07H22052 |
| Engineering (Civil and Environmental) | 07H25052 |
| Engineering (Civil with Management) | 07H20352 |
| Engineering (Mechanical) | 07H30052 |
| Engineering (Mechanical with European Studies) | 07H30252 |
| Engineering (Mechanical and Electrical) | 07HH3552 |
| Engineering (Mechanical with Computer Aided Engineering) | 07H3H152 |
| Engineering (Mechanical with Control) | 07H3H652 |
| Engineering (Mechanical with Materials) | 07H3J552 |
| Engineering (Mechanical with Management) | 07H30352 |
| Engineering (Mechanical with Oil and Gas Studies | 07H3H852 |
| Engineering (Electrical and Electronic) | 07H50052 |
| Engineering (Electrical and Electronic with European Studies) | 07H50252 |
| Engineering (Electronics with Communications) | 07H62052 |
| Engineering (Electrical and Electronic with Control) | 07H64052 |
| Engineering (Electronics and Software Engineering) | 07H6G752 |
| Engineering (Electronics and Computer Engineering) | 07H6G652 |

|  |  |
| --- | --- |
| **Programme title** | **Programme code** |
| **Bachelor of Engineering** |  |
| Engineering (Electrical and Electronic with Management) | 07H50352 |
| Engineering (Integrated) | 07H10552 |
| Engineering (Integrated Engineering with European Studies) | 07H10652 |
|  |  |
| **Bachelor of Science in Engineering** |  |
| Bachelor of Science in Engineering (General) | 07H10216 |
| Bachelor of Science in Engineering (Civil) | 07H20116 |
| Bachelor of Science in Engineering (Electrical) | 07H50116 |
| Bachelor of Science in Engineering (Electronic) | 07H60116 |
| Bachelor of Science in Engineering (Mechanical) | 07H30116 |
|  |  |
| **Degree of MSc in Safety Engineering & Risk Management** | 57H100FH |
| Postgraduate Diploma in Safety Engineering & Risk Management | 61H101YN |
|  |  |
| **Degree of MSc in Project Management** | 63H100FS |
| Postgraduate Diploma in Project Management | 63H100YM |
| Postgraduate Certificate in Project Management | 64H100YJ |