

GENERAL BOARD LEARNING AND TEACHING REVIEW

OF THE FACULTY OF ENGINEERING

MARCH 2015

Introduction

Main conclusions

Good practice identified by the Committee

Summary of recommendations

Background

Findings of the Review Committee

Appendices

Appendix A: membership of the Review Committee and its terms of reference

Appendix B: documentation received by the Review Committee

Appendix C: schedule of meetings

Introduction

1. The Review Committee was established as part of the General Board's rolling programme of Faculty and Departmental reviews of learning and teaching. Following agreement between the General Board and the Council of the School of Technology, the review was scheduled to take place in the academic year 2014-15. The membership and terms of reference for the review are included as Appendix A.
2. The Review Committee notes that the General Board's Learning and Teaching Review Schedule identified the Faculty of Engineering as the Institution subject to review. The Faculty of Engineering contains only one department: the Department of Engineering. The submission explicitly stated that all teaching in the Faculty is organised through the Department. As a consequence, the submission referred to the Department throughout. Consistent with the submission, this report will therefore refer to the Institution under review as the Department of Engineering or simply the Department.
3. The Review Committee convened on two occasions. It first met on 28 January and considered the submission from the Department of Engineering and other papers provided by Educational and Student Policy. At that first meeting, topics for detailed investigation were identified, as were areas in which further information or documentary evidence were required. The Department was then notified of these areas of interest and of the specific forms of additional data sought. On 4 March the Review Committee gathered again for the formal visit to the Department. This included a full schedule of meetings with students and members of staff in the Department of Engineering; it also considered additional material provided by the Department. Appendices B and C list the documents received by the Committee, and details the meetings held on 4 March.

4. The Department of Engineering incorporates a Language Unit, but the work of the Unit was not systematically included in the Department's submission in the context of each term of reference. The Review Committee would therefore like to record that it did not assess the Language Unit's learning and teaching provision as part of its review of the Department. The Review Committee recommends that the General Board's Education Committee consider the merits of including the Language Unit in the Learning and Teaching Review Schedule as an entity in its own right, with an appropriately-constituted Review Committee with expertise in language learning.

Main conclusions

5. Overall, the Review Committee's impression of the learning and teaching provision within the Department was highly favourable.
6. The Review Committee's main conclusions were:
 - that the evidence provided demonstrated that the courses offered matched their specifications;
 - that the aims and learning outcomes were appropriate for the degrees awarded by the University;
 - that the standards of the courses were entirely satisfactory.
7. The Review Committee noted with approval the willingness of both the Department's staff and its students to participate in the review process, and their openness during discussions with the Review Committee during its visit.
8. The Review Committee was impressed by the enthusiasm and commitment of the Department's teaching staff, which were apparent during discussions. Students appeared confident, and were clearly supportive of the Department and, in general, of its educational provision.
9. For future review processes the Review Committee would encourage the Department to include raw data in its submission and provide explicit examples to support various statements in its submission. This would allow the Review Committee to evaluate the evidence and satisfy itself of compliance with the terms of reference, whilst reducing the number of additional documents requested prior to the full day visit.
10. The Department has undergone rapid growth over the past 5 years, driven in part by the proliferation of graduate programmes. These include Master of Philosophy and Master of Research through the Centres for Doctoral Training. There were both internal and external drivers (in the form of EPSRC funding) for this expansion. The development of these programmes has benefited from some University-wide coordination, but this has inevitably not extended down to fine operational detail, where very diverse practice has emerged. The Department has recognised that there is now a need to attempt to introduce the best models across the board, in order to achieve, where relevant, a consistent form of provision and management of the Centres for Doctoral Training within Engineering (and perhaps more broadly). The Review Committee concurs with this judgement.

11. Whilst the Review Committee makes a number of specific recommendations, it concluded that there was no need to recommend a Full Review of the Department of Engineering.

Good practice identified by the Committee

12. The Review Committee wished to draw the General Board's attention to the following instances of good practice for dissemination to the wider University:

- 12.1. The Department uses web-based technology very effectively to enhance teaching provision. The introduction of Moodle has been particularly successful (para 47);
- 12.2. The Guidance to Examiners issued by the Faculty Board is exceptionally helpful as a description of key aspects of the examination process (para 54);
- 12.3. The involvement of the Department in outreach activities is very good (para 67);
- 12.4. The refinement of the operation of Research and Communication Clubs for graduate students is helping to provide an important channel for student development (para 80); and
- 12.5. The structures in place for the induction and mentoring of newly-appointed academic staff are operating very effectively (para 92).

13. The Review Committee felt that the Department should also be commended by the General Board for:

- 13.1. Improvements made to The Manufacturing Engineering Tripos following recommendations made in the last review (para 42);

Summary of recommendations

14. The Review Committee makes a number of recommendations and suggestions throughout its report. The key recommendations are gathered here and should be noted in the context of the report as a whole. The Review Committee recommends that the Department of Engineering:

- 14.1. Reinforces the exchange of best practice in its graduate provision and ensures engagement of the relevant academic staff on its Taught Courses Committee (para 25);
- 14.2. Takes steps to formalise its approach to quality assurance of shared teaching (para 30);
- 14.3. Initiates a process to revise its laboratory exercises (para 51);

- 14.4. Continues to develop methods for ensuring that the time taken by students on coursework for optional modules is roughly comparable when they are for equal credit (para 53);
- 14.5. Reinforces the importance of reporting requirements for changes to assessable content. The Department should ensure that students are fully aware of the assessable content of their course (para 56);
- 14.6. Reviews its practices relating to graduate student contact prior to their admission (para 68);
- 14.7. Continues to monitor the quality of supervisions and demonstrations to ensure that quality of supervision in Part IIA is uniformly high, and preferably also to increase the proportion of supervision undertaken by experienced permanent staff (paras 71-74);
- 14.8. Moves rapidly towards compliance with its own policy in respect of the maximum number of research students assigned to a given supervisor (para 78);
- 14.9. Develops a strategic vision of teaching provision so that it is in a better position to evaluate its future activities when the next round of external funding opportunities arises (para 98);
- 14.10. Considers a more comprehensive approach to gathering, monitoring and consideration of student feedback so that it can be tabulated on a term-by-term basis and fed through the relevant committees to inform course design and development of teaching methods (para 99); and
- 14.11. Considers introducing student representatives on committees where they do not already exist, such as on the Taught Courses Committee (para 103).

Background

- 15. The Department of Engineering is the sole department within the Faculty of Engineering. The Faculty is part of the School of Technology. The Department of Engineering is the largest within the University with 157 academic staff engaged in teaching. The Department is divided into six divisions representing different fields of engineering. There are 2123 students in total made up of 1152 at the undergraduate level and 971 graduate students (2014-15 numbers). This is close to 10% of the University's total numbers in each case.
- 16. The main undergraduate teaching programme is the Engineering Tripos which consists of two Parts taken over a four year period. Part I is taken over two years (IA and IB) and is common to all undergraduate students. Part II is taken over two years (IIA and IIB) and allows students to specialise in an engineering discipline. The Department also offers a Manufacturing Engineering Tripos (MET) with students completing a distinct Part IIA and IIB.

Undergraduate student numbers for 2014/15:

- Part IA (328)
- Part IB (273)
- Part IIA (227) and Part IIA MET (36)
- Part IIB (253) and Part IIB MET (35)

17. The Department has an arrangement with the Judge Business School (JBS) which provides teaching of “Management” within the Engineering and Manufacturing Engineering Triposes. It shares a final-year module with the Department of Architecture, and borrows or shares Part II modules with JBS, the Department of Chemical Engineering and Biotechnology, the Computer Laboratory, the Department of Physics, and the Department of Materials Science and Metallurgy.
18. At graduate level, the Department offers four taught Master of Philosophy (MPhil) programmes of one-year duration. These are: Engineering for Sustainable Development (ESD); Industrial Systems, Manufacture and Management (ISMM); Nuclear Energy; and Energy Technologies. A fifth MPhil programme in Machine Learning, Speech and Language Technology will be taught from October 2015. It also offers a two-year part-time Master of Studies (MSt) in Construction Engineering.
19. The Department has five Centres for Doctoral Training (CDTs) funded by the Engineering and Physical Sciences Research Council (EPSRC), and offers five Masters of Research (MRes) programmes: Integrated Photonic and Electronic Systems (IPES); Ultra Precision Engineering; Gas Turbine Aerodynamics; Graphene Technology; and Future Infrastructure and Built Environment (FIBE). The Department is also associated with three cross-disciplinary CDTs led by other University of Cambridge Departments: Nanoscience and Technology; Computational Methods for Material Science; and Sensor Technologies and Applications.

Student numbers in the Department’s Master’s programmes, for 2014/15 were:

- MPhil in ESD (29)
- MPhil in ISMM (36)
- MPhil in Nuclear Energy (15)
- MPhil in Energy Technologies (15)
- MSt in Construction Engineering (52)
- MRes in IPES (9)
- MRes in Ultra Precision Engineering (7)
- MRes in Gas Turbine Aerodynamics (15)
- MRes in Graphene Technology (8)
- MRes in FIBE (7)

20. The Department provides teaching and/or taught modules on the MPhil in Technology Policy offered by the JBS and on the MSt in Interdisciplinary Design and Built Environment offered by the Department of Architecture. It also works collaboratively with a large number of CDT partner Institutions including University College London, University of Oxford, University of Loughborough, and Cranfield University.

21. The Department is housed in Trumpington Street and in West Cambridge. Building work is currently underway on two separate projects. The first is construction of the James Dyson Building, to provide additional offices and meeting space for graduate students (see para 88). The second involves mainly internal works to create the Dyson Centre for Engineering Design. This will extend the facilities at the Trumpington Street site primarily for teaching undergraduate students but will also provide some benefit for graduate students (see para 87).

Findings of the Review Committee

The structure of this report parallels that in the terms of reference supplied by the General Board.

1. Overall structure of the institution

Internal committee structures and principal officers

22. The Department has a complex committee structure as detailed in the submission and represented in the organisational chart (Appendix B to the submission). The Review Committee requested a sample of minutes from the various committees and met with the Head of Department, Deputy Heads of the Department (Teaching) and (Graduate Studies) and members of the Graduate and Undergraduate Teaching Committees. Discussions with academic staff confirmed that there is a two-way flow of information between the central and sub-committees. The Review Committee was satisfied that the Committee structure is fit for purpose and, given the size of the Department, is an effective means of governance and coordination.
23. The nine Subject Groups meet once or twice each term, plus a final meeting after the end of the academic year. The Review Committee judged them to be an effective forum for considering teaching and learning provision in detail at the undergraduate level. The Chairs of the Subject Groups sit, *ex officio*, on the Teaching Committee.
24. The Review Committee was pleased to learn that staff associated with the Undergraduate Teaching Office (including the Deputy Head of Department (Teaching), Director of Undergraduate Teaching, Teaching and Examinations Coordinator, and Faculty Board Secretary) attended all committee meetings and are therefore able to monitor, coordinate and disseminate good practice.
25. There has been a rapid increase in taught graduate provision since the Department's last review and this, in part, has been due to increased EPSRC funding opportunities. The Review Committee accepted that the resulting CDT programmes were developed expeditiously and that time constraints have not permitted uniform deployment. Within this context, the Review Committee was content with the steps already being taken by the Department to put in place structures to deal with this, such as the newly-formed Taught Courses Committee (comprised of the Directors of graduate taught courses) and the recent establishment of a post for a Taught Courses Administrator. The graduate taught courses report to the Graduate Teaching Committee but do not report formally to the relevant Subject Groups. During discussions with course leaders of the graduate

programmes, it became evident that examples of good practice and 'lessons learnt' existed but that there was no mechanism for these to be formally circulated to interested parties - this was particularly apparent for the MRes programmes. **The Review Committee recommends that the Department reinforce the exchange of best practice in its graduate provision and ensure engagement of the relevant academic staff within the Taught Courses Committee.**

Formal and informal links with other Faculties and Departments

26. The Department's links with other internal faculties and departments and external institutions were detailed in its submission and referred to in paragraphs 16 and 19 above.
27. The Department has a formal agreement with the JBS that dates back to 1999. The Review Committee learnt that the agreement now acts as a framework for the allocation of teaching resources from JBS to the Department of Engineering. Provision exists in the agreement (Item 8) for the Teaching Committee to receive a joint report on the teaching of "Management", however in practice the process for reporting Engineering Management courses has been via the Engineering Management Subject group, minutes from which are provided to the Teaching Committee.
28. With respect to the Department's MRes programmes delivered through the collaborative CDTs involving other Universities, it was not clear to the Review Committee what, if any, quality assurance mechanisms were in place to monitor its collaborative provision. Despite repeated requests, the Committee was not able to determine how many Memoranda of Cooperation (or equivalent) were in place. One example of an unsigned agreement was provided and there was anecdotal evidence that another may be signed or in the process of being signed but these were not made available to the Review Committee during the review process.
29. There was a widespread understanding among the academic staff that if there was a problem with teaching provided by another University, then this would be revealed through student feedback and dealt with by the Course Director. The Graduate Taught Course Committee might expect it to come before them if it was of serious concern.
30. It was apparent that at both the undergraduate and postgraduate level, the quality assurance of borrowed or shared modules relied on good will and established relationships between individual staff members across different institutions to liaise over matters to do with quality of provision. The Committee recognised this as a pragmatic approach to quality assurance, but was concerned that the process as described is vulnerable to changes in staffing and may not be an effective long term solution particularly in light of the rapid expansion that the Department has undergone. Given there is no visible process for documenting and monitoring collaborative provision, **the Review Committee recommends that the Department takes steps to formalise its approach to quality assurance of shared teaching.**

2. The educational aims of the programmes provided by the institution

31. The Review Committee was impressed with the comprehensive information made available online for staff and students in respect of learning aims (and outcomes) at the undergraduate level. Learning aims for the Engineering and Manufacturing Engineering Triposes are articulated for each Part and for each individual paper in Part I and module in Part II.
32. The Department submitted that the QAA benchmark statements align with the PSRB competence standards published by the Engineering Council and supplied a copy of the most recent accreditation report (refer to para 107). The Review Committee noted that the Engineering Accreditation Board considered the learning aims and outcomes as part of its accreditation exercise.
33. The Department's submission sets out the process by which learning aims are reviewed, the role of the Teaching Office, responsibilities of lecturing staff, and the process of consultation with the relevant Subject Group. Extracts from Subject Group minutes and discussions with Subject Group Chairs confirmed that reviews take place periodically, as documented.
34. The Review Committee was informed that each graduate programme was designed with one of three specific purposes in mind:
 - MRes programmes, designed both to equip students for doctoral research in a specific area of Engineering, and to provide the transferable skills necessary to equip those students to be leaders in their fields;
 - Professional Practice Programmes (ESD, ISMM, Construction Engineering), designed to equip current or aspiring career engineers with the skills necessary to make a unique contribution to their profession;
 - Specialist MPhil programmes, designed to provide students with a deep knowledge of a particular area of Engineering, suiting them to future careers either in academic research or in specific industries.

The Review Committee found it particularly useful to be provided with this context and noted that the educational aims are determined with reference to the overarching purpose of the programme. These aims (and outcomes) are articulated at the programme and module level and this information is available in graduate course handbooks. The Department noted that the level of detail and consistency in formatting is not as comprehensive as at the undergraduate level, but there has been considerable improvement for academic year 2014/15. The Review Committee noted that the Department is currently undertaking an exercise to produce a comprehensive set of syllabuses which will describe the aims and objectives for all modules on offer in 2015/16. These will be approved by the Graduate Teaching Committee.

3. Learning outcomes: knowledge and skills acquired by students during the institution's courses

- 35. Target outcomes of learning are specified at the same levels as are the educational aims viz. in the context of the overall programme, the Part of Tripos and at the level of the individual examination paper. The Department describes these as 'Objectives'. The learning outcomes are determined and reviewed in the same manner as educational aims, described above.
- 36. Learning outcomes (and aims) are mapped out in detail in the programme specifications for undergraduate and graduate taught courses, including which teaching methods are designed to enable acquisition of the requisite knowledge and skills.
- 37. The Review Committee was informed, in discussions with MPhil teaching staff, that the course handbooks were re-written last year. The Review Committee was content that the learning outcomes are appropriately specified.

4. Curricula and assessment of the institution's courses

Course Design

- 38. The Review Committee considered the process of course design as detailed in the Department's submission. The Subject Groups (as referred to in paras 23 and 100) play a pivotal role in the development, evaluation and review of modules at the undergraduate level. The Undergraduate Teaching Office has a central role in coordination.
- 39. The Review Committee noted the role of the Course Director, Degree Committee, Graduate Teaching Committee and Faculty Board in the design and approval process for Taught Graduate Courses.
- 40. The Review Committee was satisfied that material is taught at the appropriate level and takes into account appropriate benchmarks. This view is supported by External Examiners' and Engineering Accreditation Board reports.
- 41. Students undertake a core set of papers in Part I, and in Part II they are able to select from modules in a chosen engineering discipline. The Committee was satisfied that mechanisms were in place for the Department to assure reasonable uniformity of standards across Part II of the Tripos regardless of the specialisation. The Review Committee was told that there are strict guidelines for hours spent in the laboratories, that modules must have three or four accompanying examples' papers, that guidelines exist on how long each paper should take to work through, and that coursework requirements are common across modules.
- 42. Notably, the report submitted after the previous review raised some concerns in relation to the structure of the Manufacturing Engineering Tripos. It was evident to the current Review Committee that the Department has undertaken constructive measures to revise the design and delivery of the course. The Committee heard positive comment about the

revised course from the students it met (see also para 47). **The Department should be commended for its improved learning and teaching provision with respect to the Manufacturing Engineering Tripos.**

43. In discussions with Subject Group Chairs, the Review Committee reached the conclusion that the structure and content of Part I of the Tripos is well established and tightly constrained by the need to cover specific topics in a rational order. This leaves little scope to make changes in Part I. In comparison, Part II is more flexible due to its modular structure, and the intention to offer opportunities for specialisation at this higher level. The Director of Undergraduate teaching confirmed that despite the constraints, if there is a good pedagogical reason for making a change in Part I, then this is considered. The Lego project (as referred to in para 47) is an example of change successfully carried out. The Review Committee also noted the introduction of an integrated coursework exercise in the second year to replace a number of isolated laboratory exercises.
44. The Committee investigated the process of instigation of alteration to courses, and found widespread agreement that most of the impetus comes from individual members of staff. It transpired that the cycle of sabbatical leave was a big determinant in the overall turnover of allocation of courses to specific staff members, with most academics spending six years teaching the same course. The Review Committee noted other drivers of change included student feedback, internal and external feedback, annual or periodic reviews.

Teaching Methods

45. The Review Committee was impressed by the enthusiasm and commitment of the Department's teaching staff at both the undergraduate and graduate level, which was apparent during the visit to the Department.
46. The teaching methods involve a combination of lectures, supervisions, laboratory experiments and projects (supervisions are discussed at paras 71-74). The Department's submission indicated that its teaching staff are encouraged to adopt appropriate techniques to suit their teaching style and the demands of the material being covered. It was evident through discussions in the context of undergraduate teaching, that teaching methods are discussed and best practice disseminated within the subject groups. There was also evidence that the fast feedback system (referred to in para 75) has the ability to prompt teaching staff to modify the delivery of material from lecture to lecture as a course is being given.
47. The Review Committee was impressed with the web-based technology that the Department employs. The information contained in the online resources section of the teaching website is comprehensive and there is widespread use of Moodle across nearly all programmes. The remaining two Master's courses will move to Moodle for the next academic year. Student views of Moodle as an alternative to CamTools were extremely positive. **The Review Committee was pleased to learn of numerous examples of**

innovative and interactive approaches to teaching and commends the Department for its effort in this area. Examples included:

- the introduction of tablet-based teaching in MET which was viewed favourably by the students. Many spoke specifically about the benefits received from an application purchased by the Department which allows them to make electronic notes on the taught material.
- The introductory Lego “mindstorms” exercise introduced into Part IA in 2010 involves students working in small teams to design and build a Lego system to demonstrate an aspect of engineering science. The exercise includes a presentation of their creation to other teams. The exercise was specifically timetabled for the beginning of the first term of the Tripos to aid induction, the benefits of which are manifold. It facilitates student interaction at an early stage. It also provides students with practical hands-on design experience early in the course and equips students with the skills to write basic programs in Matlab. The Review Committee noted that feedback is received from 100% of students who undertake the exercise and is predominately positive. The Review Committee heard that minor modifications to documentation, scheduling and facilities have been subsequently made to the exercise as a result of student feedback.

48. The Review Committee noted that, in addition to the methods of teaching outlined in paragraph 46, graduate courses frequently involve working on projects in an industrial setting and involvement in Research and Communications Clubs. Both of these elements are further discussed in paras 83 and 79.

Assessment Methods

49. The Engineering and Manufacturing Engineering Triposes use course work and formal examinations to assess students. A major project is undertaken in Engineering Part IIB. Taught components of graduate courses are assessed in the same manner as undergraduate modules and there is a compulsory dissertation or equivalent. In addition, assessment of graduate research courses includes research exercises in the form of short reports, laboratory exercises and group projects. The weighting of the various assessment tasks for MPhil and MRes programmes was provided as Appendix C to the Department’s submission.

50. The Committee considered the application of “standard credit” for assessment of practicals – in which marks are awarded for participation irrespective of the result. The Review Committee welcomed students’ opinions on the benefits and disadvantages of the approach and the impact this had on their learning. The Review Committee concluded that the credit arrangements were appropriate.

51. There was a general consensus amongst students that project-based laboratory experiments were the most useful. In contrast, students were critical about the short laboratory exercises, suggesting the material was outdated; some questioned their relevance. The timing of the laboratory sessions, and integration with lecture materials was also raised as an issue. **The Review Committee acknowledges that updating the laboratory exercises will be labour-intensive, and would have to be phased over**

an extended period of time, but recommends that the Department plans and undertakes this process of revision.

52. The Review Committee was pleased to see that the Department had robust mechanisms in place for the moderation of coursework, particularly the Projects taken in Part IIB. The process requires the Group Examiner to ensure that the Supervisor's and Assessor's marks are supported by appropriate comments and encourages the Group Examiner to meet with the Supervisor and Assessor where there is a discrepancy of 10% or more. The Department has revised the mark form which now includes a section for the Moderator to record their mark and reasoning. Discussions with teaching staff confirmed their understanding and support for the process.
53. The Review Committee considered the issue of the students' workload in respect of coursework and how the Department monitors this. The Department's current practice is to indicate to students the expected number of hours that should be spent on a given assessment task. Students are then required to submit a cover sheet with the assessment which asks how many hours the student took to complete their work. A number of students expressed concern over this and indicated that, depending on the coursework being undertaken, the hours spent far exceeded those indicated. Students were wary about recording the actual hours spent - they wished to avoid giving the impression that they were not coping adequately with the work, and they were concerned that they may be penalised for taking longer than suggested for a particular piece of submitted work. **The Review Committee was supportive of the Department's intention for capturing information on time taken for marked work, but recommends that the Department continues to develop methods for ensuring that the time taken by students on coursework for optional modules is roughly comparable when they are for equal credit. This might include, but not be limited to, developing an anonymous method for collecting information on the time taken by students on coursework, and making it more clear to students the purpose for which the information is collected.**
54. The Review Committee met with teaching staff from the CDTs to discuss their early experiences of the new CDT programmes. It was apparent that course leaders were simultaneously engaged in delivery and evaluation of the programme. Problems relating to the scheduling of coursework assessment were already apparent and thought was being given as to how to address these as they emerged. Similarly, in discussion with MPhil students, the Review Committee found that the scheduling of assessments was a cause for concern. Student opinion was that some assessment tasks do not rely on lecture material and could be timetabled earlier in the academic year to aid even distribution of the workload. The Review Committee encourages the newly-formed Taught Courses Committee to monitor feedback and consider the practical and pedagogical implications of the scheduling of assessment for Master's programmes.
55. **The Review Committee commended the Department on the issuing of Faculty Board Guidance to Examiners** which sets out requirements and best practice in setting examination papers, structure of questions, marking scheme and model answers, paper checking, marking and scaling.

56. The Review Committee asked teaching staff how students know what is examinable, particularly where changes to the course had been made. The Review Committee noted the overwhelming response from Part I staff was that all lecture material that was taught was assumed to be assessable unless otherwise indicated. The Review Committee was concerned that there was a widely held belief among Part I lecturers that they were at liberty to modify content during the course of the academic year to a minor extent without the need to report this upwards through the Committee structure. There also appeared to be a limited understanding of the need for Form and Conduct Notices to reflect changes in the examination structure. **The Committee recommends that the Department reinforces the importance of such reporting requirements and ensures that students are fully aware of the assessable content of their course.**

Achievement of Learning Outcomes

57. At the request of the Review Committee, the Department supplied PhD submission rates (refer to para 77) and undergraduate admission, progression and completion data. The Review Committee discussed the figures with the Deputy Heads of Department (Teaching) and (Graduate Studies) and had no concerns in relation to student attrition.
58. The Review Committee considered the measures adopted by the Department to ensure that students are achieving the stated learning outcomes, including the responsibilities of the Directors of Studies, Course Directors and Research Supervisors in monitoring student progress. It was evident that data on examination performance and graduate destinations is reported to, and analysed by, appropriate bodies.
59. Internal assessors report on the number and type of graduate students who take a given Part IIB module, but data are not routinely collected regarding the comparative performance of Part IIB and MPhil students. Course Directors of the MPhil programmes suggested to the Review Committee that External Examiners play a role in comparing the achievement levels of the two cohorts. The Review Committee was informed that, anecdotally, the MPhil cohort perform as well as, if not better than, the Tripos students.
60. The Review Committee noted that the Engineering Accreditation Board was satisfied that samples of undergraduate student work demonstrated appropriate coverage of learning outcomes.
61. In view of the relationship between feedback of assessment results and the achievement of learning outcomes, the Review Committee noted that undergraduate students expressed concern about the nature and timing of feedback and/or their ability to make use of the feedback. The Department was optimistic that a recently-redesigned marking coversheet for Part II coursework should improve the quality and consistency of feedback to students. MPhil students similarly reported to the Review Committee that feedback from academic staff was also of variable quality and not always timely. The Review Committee urges the Department to consider whether the new coversheet could be adapted for use across the MPhil programmes.

Transferable Skills

62. Transferable skills are documented in the programme specifications. The Department's statement on transferable skills is available online. This encompasses communication, organisational and interpersonal skills as well as research, numeracy, literacy and language skills. Students can undertake language courses through the Department's own Language Unit; these courses can be credited towards fulfilment of the requirements for the Tripos. Graduate students are also encouraged to utilise the Language Unit, although in this case the courses do not carry credit.
63. The Engineering Accreditation Board reported that the communication skills of the students seen by the Board members were excellent; the Board was also pleased to note that students have to present their Part IIB projects to a wide audience. The Review Committee was equally impressed with the confident and articulate nature of the undergraduate and graduate students with whom it held meetings.
64. The Department reported that its External Advisory Committee (see para 105) provides feedback on the abilities of recent graduates who take up technical roles.
65. The Review Committee was pleased to learn that one of the terms of reference for the Graduate Teaching Committee was to ensure that training in transferable skills is available, and provided to all graduate students. The Committee noted the Department's encouragement for research students to undertake the Researcher Development Programme (consisting of training courses, workshops and events designed to support PhD students, including skills in writing and presentation). The Research and Communications Clubs (referred to in paras 79-80) also fulfil this function.

5. Student support

Student Admission and Induction

66. The Review Committee learnt that demand from undergraduate students is at a record level, with seven applicants for every available place. The Review Committee discussed the Department's plans to increase its undergraduate intake by 10%. The Department's capacity is dictated by the number of academic staff and physical space available. Though it is striving to reach a figure of 360 undergraduate students entering Part IA, the Department acknowledged that it is not in a position to exceed this size, and also noted that student numbers are determined by the aggregate of individual College policies on admissions.
67. The Department's submission outlined a range of outreach activities, which are coordinated by a dedicated Outreach Officer. One example is the Department's newly-created "I want to study engineering" website. **The Review Committee commends the Department for its outreach activities and for the information it publishes.**
68. The Department's arrangements for both graduate and undergraduate induction (commencing with registration on arrival and a one- or two-day programme of events) were detailed in the submission and appeared comprehensive. However, during the site visit, postgraduate students on taught courses expressed the view that they had limited

communication with the Department prior to their induction day, which they felt was in stark contrast to the contact initiated by the Colleges. **The Review Committee recommends that the Department reviews its practices relating to graduate student contact prior to their admission.**

Undergraduate Supervisions

69. Individual teaching for undergraduate students is primarily based in their College. Supervisions in Part I are organised by the College Directors of Studies. The Committee explored the Departmental relationships with the Colleges, particularly whether it was able to assure itself of the quality of the supervisions provided to students in Part I of the Tripos. The Department formally meets Directors of Studies in a committee twice a year and asserts that this provides a forum for useful discussions. The Department actively provides resources to the supervisors in the form of examples papers and crib sheets.

70. The Department provides its own Examples Classes as a 'safety net' for students who have not received adequate supervision through their college on a specific paper. The Review Committee discussed the Examples Classes with teaching staff and learnt that that the sessions were optional and attended by approximately 10% of students. They indicated that the classes are tailored to specific examples and are quite structured. Lecturers recognised that the classes could benefit from being more interactive. The students themselves felt the classes do not provide an opportunity to ask general questions relating to the examples papers; they only focused on the solution to a set problem. Students suggested that means of improving access to academic staff for the purpose of asking questions might include consultation hours or examination preparation or revision sessions prior to exams. **The Review Committee recognises the important function of the Examples Classes, however, it encourages the Department to consider whether the format could be enhanced.**

71. Part IIA supervisions are organised by the Department rather than by the Colleges. The Committee noted the high proportion of such supervisions which are given by postgraduate research students (64%) or post-doctoral research staff (21%). Both the University Teaching Officers and undergraduates are aware that the quality of supervision is variable. This was also true of demonstration in practical classes. There is very clearly a substantial threat to the overall quality of educational provision in the University which derives from the decline in participation in small-group teaching by more experienced tenured academic staff. Teaching by research students and young postdoctoral researchers can be very effective, but it will always lack the extra dimension which can be expected to derive from long experience. It is inevitable that the overall quality of university teaching will suffer if the input from experienced academics is reduced, whether because of their withdrawal from the provision or because they are unable to communicate their expertise effectively. The fact that the supervision system is notionally the responsibility of the individual colleges, yet at Part II level is managed by the Department, represents a risk to quality control at Departmental level.

72. The Review Committee noted the Department's view that it is difficult to attract demonstrators as a result of having to compete with the pressure on young researchers to engage in research. For some potential demonstrators the level of remuneration is an

impediment, and for those located at West Cambridge, so is the inconvenience of having to travel to teach at the Trumpington Street site.

73. The Review Committee was informed by the research students it interviewed that the training in undergraduate supervision took the form of a 1-2 hour seminar plus online materials.
74. The Review Committee noted that the Department has discussed the quality of Part IIA supervisions through the Staff-Student Joint Committee. As a consequence, supervisors were provided with feedback and additional guidance was prepared for poorly performing supervisors. **The Review Committee recommends that the Department continue to monitor the quality of supervisions and demonstrations to ensure that quality of supervision in Part IIA is uniformly high, and preferably also to increase the proportion of supervision undertaken by experienced permanent staff.**
75. The Department has a fast-feedback system where students can anonymously report issues to the Teaching Office who then enter into a dialogue with the relevant academic so that remedial action can be taken. The Review Committee learnt that the Director of Teaching had in the past intervened to assure lecturing quality by attending specific lectures which had been the subject of complaints submitted through fast feedback. The system generates, on average, four emails per day and undergraduate students acknowledged that the system was generally effective at rapidly dealing with problems.

Research Student Support

76. The Department reported in its submission that its research students are able to draw upon a wide range of colleagues for support. Each research student has a Supervisor and an Adviser. For taught students, the role of the Supervisor is replaced by the Course Director. Students work within the context of a Research Group comprising both teaching and research staff and other doctoral students. Students are made aware of the various people they can approach if they are having difficulty with their Supervisor and a Graduate Student Mediator is available to offer confidential advice.
77. The Review Committee received the PhD submission rates for cohorts commencing within the last 5 years, and noted that there had been some improvement since the last Learning and Teaching Review. On average, the submission rates meet or exceed average Cambridge University submission rates. The most recent figures available are for those students who commenced studies in 2010/11, where just over 75% of students submitted their PhDs within the four-year period. The Deputy Head of Department (Graduate Studies) meets with each Head of Division to review PhD submission rates, consider supervisor performance and monitor for systematic variations.
78. There was evidence that the Department considered revisions to the University's Code of Practice for Research Students at its Graduate Teaching Committee meeting of 17 November 2014 (Minute 14.26) and agreed to recommend to the Degree Committee that the maximum number of students per supervisor would remain at eight, and that exceptions may be granted on application to the Deputy Head of Department (Graduate Studies). On request, the Department provided the Review Committee with the names of

the academics currently supervising research students and the number of students per supervisor. The Committee was concerned that 13 members of staff were supervising in excess of 8 students, with one supervising 20 students and the others between 10 and 16. The Deputy Head of Department (Graduate Studies) reported that many of these supervisors have exemplary records when it comes to submission rates. However, **the Review Committee remains concerned about the impact of excessive numbers on both staff and students and therefore recommends that the Department moves rapidly towards compliance with its own policy in this respect.**

79. The Department states that the Research and Communication Clubs (RCCs) are an important aspect of student support. Most research groups run an RCC, and there is at least one RCC in every Division. The RCCs are intended to equip students with research skills, through a series of workshops, training sessions and exercises in writing and presentation. The Department stated that RCC leaders are able to identify students who may need extra support. If problems with use of English are identified at this stage, students will be referred to the Language Unit; other difficulties will be brought to the attention of the student's Head of Division. It was not clear why there should ever be a language problem, and the Review Committee presumes that a high level of competence in the use of English should be *sine qua non* for admission to the University.
80. The Review Committee noted that feedback from PRES 2013 included a number of negative comments in relation to the RCCs. The Deputy Head of Department (Graduate Studies) reported that up until last year, the breadth and quality of material covered varied across Divisions. The Review Committee learnt that for the last two years, the Department had been running an anonymous feedback exercise online for PhD students and the data had been used to instigate more uniformity in their provision of RCCs. The Review Committee was pleased to hear that the material has been re-written and the RCC leaders were now required to submit the syllabus to the Graduate Teaching Committee before the start of Michaelmas Term. The Review Committee was satisfied with the level of wellbeing, language and research support available to graduate students and regards the RCCs as an important aspect of this support. **The Review Committee commends the Department for its refinement of the RCCs and supports their continued use.**

Placement learning and collaborative provision

81. In their third year, students are able to participate in a number of exchange programs at foreign institutions, namely Massachusetts Institute of Technology (MIT), the National University of Singapore (NUS) and the Ecole Centrale Paris (ECP). Each exchange has an academic coordinator in Engineering, and the Director of Undergraduate Education supervises the exchange programmes. The exchange with MIT takes 15 engineering students per year, while those with ECP and NUS take one or two students each year. In discussion with students who had returned from an exchange, the Review Committee was pleased to hear that they viewed the experience very positively and felt supported by the Department, both while abroad and during the transition to their final year of study on return to Cambridge. It was evident that the most systematic coordination and support was provided for MIT exchanges; this is unsurprising given this exchange has been established the longest and involves the largest number of students.

82. The Review Committee sought evidence of the quality control mechanisms put in place by the Department for students participating in industrial placements. At the undergraduate level the Department has established relationships with more than 3000 employers, and places students with a subset of them on an annual basis; records of placements are maintained by the Department in a database. The Review Committee is satisfied that the database allows for accurate recording of placement details and that students are issued with adequate guidance prior to undertaking their placement. The Review Committee noted that the logbook produced by the student, verified by the employer, and presented to the Industrial Placement Coordinator provided effective monitoring of the achievement of students on placement as do the site visits undertaken by the Industrial Placement Coordinator.
83. At the graduate level, a number of programmes provide for credit-bearing industrial placements (MRes in Gas Turbine Aerodynamics, MPhil in ESD and MPhil in ISMM). In the case of ISMM, students complete four industry-based projects, each of two weeks' duration: each student is embedded in a company and reports to a senior line manager. There is also provision within some programmes for students to write their dissertations based on industrial projects (MPhil in Nuclear Energy, MRes in Ultra Precision Engineering and MRes in FIBE). The Review Committee discussed with members of the Graduate Teaching Committee and the Taught Courses Committee the monitoring of industrial placements. The Review Committee heard that the academic supervisor was responsible for setting up the project and preparing a brief which is approved by the Course Director. In practice, most students are placed with a company with which the Department already has an established relationship. However, where a company participates for the first time, a member of the Department will visit the organisation, provide them with a document detailing the policy regarding placements, and ensure the industrial supervisor is made aware of the academic requirements. The Review Committee noted that the Department conducts a follow-up meeting with each student to ascertain whether their placement matched their expectations; the information gathered feeds into the allocation process for future placements.
84. The reporting line for industrial projects involves the Graduate Teaching Committee. The Review Committee noted, for example, that a new project supervision "primer" was produced for the MPhil in Nuclear Energy and this was sent to the industrial partners explicitly spelling out expectations and standards.
85. The Review Committee is satisfied that the Department has mechanisms in place to assure itself of the quality of industrial placements undertaken by its students.

6. Learning resources

Library, IT and accommodation

86. The Review Committee undertook a tour of the laboratories located in the Baker Building at the Trumpington Street site. This included the Design and Project Offices and the electrical, materials, structures, soil dynamics, mechanical, hydraulics and heat labs. The Committee noted the provision of equipment covered a wide range of types, sizes

and ages. Some apparatus and experiments could be described as venerable, but still appeared effective. There was clearly an impressive and heartening dedication and enthusiasm shown by the assistant staff responsible for the laboratories. Students identified the ability to access laboratories throughout the day as a beneficial feature of the Department's resource provision. The Review Committee noted that Part I teaching staff located at West Cambridge commented on the difficulty of including demonstrations in lectures at the Trumpington Street site, due in large part to problems associated with storage of materials.

87. The Review Committee was pleased to learn about progress on the construction of the Dyson Centre for Engineering Design facilitated by a donation of £2M from the Dyson Foundation, augmented by £2.65M from HEFCE. The Dyson Centre has been designed to expand the provision of group and project working space, extend the facilities for the teaching of design, and provide modern workshop facilities for both curriculum-based and extra-curricular activities.
88. The Department highlighted in its submission problems associated with graduate hot-desking arrangements and lack of adequate social space. The Review Committee asked teaching staff about availability of student space and resourcing more generally and received mixed responses. The ISMM MPhil was utilising virtually brand-new facilities at the Institute for Manufacturing at West Cambridge and though hot-desking arrangements were in place, these appeared to be working satisfactorily. This was echoed by the students with whom the Review Committee discussed the topic. The course director of the Nuclear Energy MPhil had concerns regarding hot-desking arrangements as well as lecture and social space. The FIBE MRes teaching staff also reported shortage of space but were confident that the James Dyson Building (which is partially funded by a £6M contribution from the Dyson Foundation) would resolve these concerns once built. Postgraduate students specifically mentioned the lack of social space.
89. Graduate teaching staff acknowledged that timetabling could on occasion be problematic with MPhil teaching needing to fit in amongst the undergraduate timetable. However, the newly-appointed Taught Courses Administrator was bringing about a greater level of central coordination.
90. As referred to previously (para 47), the Review Committee was impressed with the Department's online resources as part of its "web-first" strategy. Wireless internet and IT facilities are widely available. The Review Committee noted that the library is undergoing refurbishment in 2015, with expected completion by Michaelmas 2016.
91. The Review Committee acknowledges that there are some problems regarding provision of space, however, it is satisfied that there are no significant concerns regarding learning resources, and notes the positive effects on the learning environment of the continued development of the Department's resources on the West Cambridge site.

Staff

92. The Review Committee met with several early-career staff and discussed aspects of induction, probation, mentoring and career development. It was apparent that they felt valued, supported and were well integrated. **The Review Committee commends the Department on its induction process which appears to be comprehensive, well organised and uniform in its application across the Department, regardless of the Division into which staff are appointed.**
93. Early-career and experienced teaching staff reported that for first-time lecturing of an established course, the handover process works well. The Department expects that lecture notes, examples papers, and crib sheets are made available and it was apparent that this occurs in practice.
94. The Review Committee noted that it had difficulty obtaining a complete set of data relating to the teaching loads of engineering staff despite the existence of a Departmental Teaching Allocation Database. The submission set out the details of the database and the process used to populate it. In summary, all undergraduate teaching loads are recorded and notional “points” are allocated to various duties. Chairs of each Subject Group speak to teaching staff within their Division to map out duties for the following year. Each Chair then meets with the Undergraduate Teaching Office for central review of the allocation to ensure that no individual staff member appears to have too heavy or too light a teaching load. All staff are able to view the complete teaching allocation database. **The full data should be made available for the next Review.**
95. The Review Committee noted that the database does not include undergraduate supervisions (with the exception of fourth-year project supervisions). The omission of supervision is apparently a deliberate choice, made after the Department attempted, unsuccessfully, to incorporate these duties. The rationale provided by the Department was that not all staff are required to have a college affiliation so although there is scope for academic staff to declare their supervision work, it is not routinely captured nor required. The database does not currently include graduate teaching in a comprehensive fashion. The Department recognises that the system of “teaching points” has not yet been adjusted to accommodate the expansion in taught Master's courses and the new Taught Courses Administrator has been assigned the task of examining the system for allocating teaching points for graduate-related activities. The Department anticipates that the new system will be in place for the next academic year.
96. Despite the limitations set out above, the Deputy Head of Department (Teaching) reported that the “points” system is widely accepted and the majority of staff are content with the allocation process. The Committee discussed teaching loads and distribution with each group of staff that it met, and no concerns emerged as a result. It was evident in discussion with undergraduate lecturing staff that:
- a consistent approach was adopted across Subject Groups;
 - Chairs are consultative and duties are determined in partnership with staff;
 - staff were affectively involved in the process of allocation of duties; and
 - staff do access the database to view each other's teaching loads.

97. The Committee is satisfied that the system is clear to its participants, equitable and fulfils its function. The Review Committee was satisfied by the Department's intended schedule for incorporation of graduate teaching duties into the database.

7. Maintenance and enhancement of standards and quality

Review of L&T provision

98. The Department does not have a strategic plan. The Department's Research Excellence Framework (REF) Environment Statement sets out its research strategy; there is no documented strategy for its learning and teaching provision. The Department concedes that it has recently been primarily focused on development and delivery of the graduate courses and the move to West Cambridge. Whilst the Review Committee acknowledges that Department has gone through a rapid period of growth in respect of their FHEQ level 7 provision and is now taking steps to consolidate, **it recommends that the Department develops its strategic vision of teaching provision so that it is in a better position to evaluate its future activities when the next round of external funding opportunities arises.**
99. The Review Committee was concerned that there was no systematic means of collecting and considering student opinion. It was apparent that student feedback is obtained through a variety of surveys and through the fast-feedback system. Furthermore, individual lecturers also deploy other means of gathering feedback such as via their supervising duties, or by requesting feedback from their students for the purposes of personal improvement. **The Review Committee recommends that the Department consider a more comprehensive approach to gathering, monitoring and consideration of feedback so that it can be tabulated on a term-by-term basis and fed through the relevant committees to inform course design and development of teaching methods.**
100. The Review Committee found that the Department's process for course review was sound. Subject Group Chairs confirmed that any changes are floated before the Subject Group and that a consensus is reached before any changes are endorsed. Taught graduate programmes are reviewed annually. To date this has been primarily undertaken as part of Board of Examiners meetings, but in future the newly-formed Taught Courses Committee will be involved in regular and detailed discussion of graduate provision.
101. In addition to the annual review of programmes, there was evidence of periodic large scale reviews having been undertaken, such as the Part I Engineering Review in 2010, and preliminary meetings recently held to commence the review of Part II. The large scale reviews encompass structure and content as well as methods of teaching and assessment.
102. The Review Committee considered reports of four annual course reviews that had been presented to the Graduate Teaching Committee for academical year 2013-14 in Energy Technologies, ISMM, Nuclear Energy and Sustainable Development.

103. The Review Committee was pleased to learn that the Staff-Student Joint Committee meets regularly (twice per term) and student representatives reported that the Department was very responsive. However, the Review Committee was concerned that there was a lack of uniform student representation across the committee structure, particularly at the postgraduate level. The Review Committee heard from a number of teaching staff on the taught graduate courses and subsequently met with students. There was an obvious disjunction between the perceptions of staff and students. **The Review Committee recommends that the Department consider introducing student representatives where they do not already exist, such as on the Taught Courses Committee.**

External Quality Assurance (External Examiners/ External Advisors/ Accreditation)

104. The Review Committee was satisfied that External Examiners' reports are discussed in the appropriate undergraduate- and graduate-level committees. Minutes indicate that where matters arise they are referred to the appropriate Subject Group or Course Director for follow-up. The Review Committee noted the Department's written responses to External Examiners addressing concerns that they have raised.
105. The Department has External Advisors on each Subject Group. The Review Committee was informed that these advisors provide an outside perspective on developments in engineering that might impact on the teaching within a subject. Feedback from industry has not identified any deficiencies in the Tripos syllabus. External Advisors also form part of the External Advisors Committee to consider Tripos-related teaching matters. This committee meets annually and reports to the Teaching Committee. The 2014 minutes demonstrate that External Advisors were consulted over proposed changes to the Part IIA course, were broadly supportive of the proposals, provided feedback and made recommendations.
106. There are no equivalent External Advisor appointments for graduate courses. The Department submitted that the External Examiner is able to provide much more detailed external scrutiny than is possible for the undergraduate courses, owing to the relatively small cohort size. The Review Committee noted that external academics were involved in their Academic Management Committee for the MRes programmes.
107. The Engineering and Manufacturing Engineering Triposes are accredited by the Engineering Accreditation Board on behalf of the UK Engineering Institutions. The courses were last accredited in 2012 for a period of six years. The Review Committee noted that the Nuclear Energy and Energy Technologies programmes are in the process of seeking accreditation from the Energy Institute, and the Construction Engineering programme is seeking accreditation through the Joint Board of Moderators.

APPENDICES

Appendix A: membership of the Review Committee and its terms of reference

Membership of the Committee

Professor Richard Phillips (Chair), Department of Physics

Dr Rachael Padman (General Board), Department of Physics

Dr Patrick Barrie (School), Department of Chemical Engineering and Biotechnology

Professor Guy Houlsby (External), Department of Engineering, University of Oxford

Mr Rob Richardson (Student), Cambridge University Students' Union

Ms Nicole Ranieri (Secretary), Educational and Student Policy

Terms of Reference

- 1 Overall structure of the institution
 - a. Internal committee structures and principal officers
 - b. Formal and informal links with other Faculties and Departments
- 2 The educational aims of the programmes provided by the institution
- 3 Learning outcomes: knowledge and skills acquired by students during the institution's courses
- 4 Curricula and assessment of the institution's courses
 - a. Course design
 - b. Teaching methods
 - c. Assessment methods
 - d. Achievement of learning outcomes
 - e. Transferable skills
- 5 Student support
 - a. Student admission and induction
 - b. Student support arrangements
 - c. Placement learning and collaborative provision (if relevant)
- 6 Learning Resources
 - a. Resources
 - b. Library, IT, accommodation
 - c. Staff
- 7 Maintenance and enhancement of standards and quality
 - a. Review of learning and teaching provision
 - b. External quality assurance

Appendix B: documentation received by the Review Committee

Documentation accompanying submission:

T.o.R 1

- Academic Committee - membership and minutes
- Teaching-related committees - membership, remit and sample minutes
- Agreement with Judge Business School

T.o.R 2 & 3

- Part I Engineering Review Group – minutes and actions
- Review Report of IA Lego Exercise
- Part II Engineering Review – Teaching Committee papers
- URLs:
 - > <http://teaching.eng.cam.ac.uk/>
 - > www.ifm.eng.cam.ac.uk/education/met
 - > <http://teaching.eng.cam.ac.uk/content/engineering-tripos-part-ia-1p1-mechanics-2014-15>
 - > <http://www.engc.org.uk/ukspec.aspx>
 - > <http://teaching.eng.cam.ac.uk/content/part-ib-guide>

T.o.R 4

- External Examiners' Reports 2014 – IA, IB, IIA, IIB (ET)
- External Examiners' Reports 2014 – IIA, IIB (MET)
- Marking & Classing Criteria 2014-15
- Advice on Good Practice in Examinations 2014-15
- Faculty Board Guidelines for Examiners and Assessors 2014-15
- NSS Feedback
- Faculty Board Report on DHLE Results 2014
- URLs:
 - > <http://teaching.eng.cam.ac.uk/information/course-information/part-ib/content>
 - > <http://teaching.eng.cam.ac.uk/content/transferable-skills-statement>

T.o.R 5

- Letter to Colleges re: increased admissions
- Quality control of industrial placements
- URLs:
 - > <http://i-want-to-study-engineering.org/>
 - > <http://www3.eng.cam.ac.uk/admissions/>
 - > <http://teaching.eng.cam.ac.uk/information/all/offer-holders/content>
 - > <http://teaching.eng.cam.ac.uk/content/part-ia-start-year-course-information>
 - > <http://teaching.eng.cam.ac.uk/content/inclusive-teaching>

T.o.R 6

- Teaching Office Database - points translation table
- Teaching Office Database - updates schedule
- Teaching Office Database - roles and allocation schedule
- Teaching Office Database - example view
- Academic numbers by gender (2008 – present)

T.o.R 7

- Teaching Committee – minutes
- PRES 2013 Results
- External Advisors Committee – terms of reference
- International Visiting Committee – membership and 2014 report
- Engineering Accreditation Board Report

Appendices

- Appendix A: Update on actions taken since the L&T Review 2009
- Appendix B: Teaching related Committee Structure (Chart)
- Appendix C: Taught Courses Assessment Structure (Table)

Supplementary documentation:

- Analysis of progression by students with 3rds/2.2s (2010)
- Admission and attrition data (2010-2014)
- Students put in standing to proceed to Part IB by the Applications Committee
- Unsigned CDT Agreement – Gas Turbine Aerodynamics
- Report of the Engineering Management Review 2013
- PhD Submission rates
- Profile of IIA Supervisors
- Student numbers per supervisor 2014-15
- Division B Teaching Points 2014-15 and 2015-16
- Division C Teaching Points 2014-15 and 2015-16
- Division F Teaching Points 2014-15 and 2015-16
- Teaching Duties Spreadsheets (Groups B,C & F)
- Hours by Supervisor category 2013-14
- Moderation of course work and projects
- IIB Projects – Final Report Mark Form
- Examiner's Report 2014 - Molecular Thermodynamics
- Examiner's Report 2014 – Power Electronics and Applications
- Assessor's Report 2014 – Image Processing and Image Coding
- Assessor's Report 2014 – Machine Learning
- Assessor's Report 2014 – Biosensors
- Course Director's Annual Report to Graduate Teaching Committee – MPhil in Energy Technologies

- Course Director's Annual Report to Graduate Teaching Committee – MPhil in ISMM
- Course Director's Annual Report to Graduate Teaching Committee – MPhil in Nuclear Energy
- Course Director's Annual Report to Graduate Teaching Committee – MPhil in Engineering for Sustainable Development

ESP documentation:

ESP.1 External Examiners' Reports

1.1 Reports 2009-10

1.2 Reports 2010-11

1.3 Reports 2011-12

1.4 Reports 2012-13

ESP.2 Annual Quality Updates (AQU)

2.1 AQU 2010-11

2.2 AQU 2011-12

2.3 AQU 2012-13

ESP.3 General Board Learning and Teaching Review 2009

3.1 Review Report

3.2 Departmental Response

ESP.4 National Student Survey (NSS)

4.1 NSS Results 2011

4.2 NSS Results 2013

4.3 NSS Results 2014

4.4 NSS Comments

ESP.5 Postgraduate Research Experience Survey (PRES)

5.1 PRES Results 2013

ESP.6 Postgraduate Taught Experience Survey (PTES)

6.1 PTES Results 2013

6.2 PTES Results 2014

6.3 PTES Comments

ESP.7 Staff List

ESP.8 Careers Service

ESP.9 Student Data

9.1 Student Statistics 2013-14

9.2 Student Exam Results 2014

9.3 Student Load 2013-14

ESP.10 Programme Specifications

ESP.11 Senior Tutors' Standing Committee on Education (minutes)

ESP.12 General Board Education Minutes (minutes)

ESP.15 Code of Practice for Research Students 14-15

Appendix C: schedule of meetings

Wednesday 4 March 2015

Time	Session
8:30-9:00	Review Committee – Private meeting
9:00-9:45	Meeting with the Head of Department and Deputy Heads
9:45-10:30	Meeting with members of the Undergraduate Teaching Committee
10:30-10:45	Review Committee – Private meeting
10:45-11:15	Meeting with Part IA and IB teaching staff
11:15-11:45	Meeting with Part IIA and IIB teaching staff
11:45-12:15	Tour of IA and IB practical spaces
12.15-12.30	Review Committee - Private meeting
12:30-13:30	Meeting with undergraduate students across parts I and II of the Engineering and Mechanical Engineering Triposes.
13:30-14:15	Meeting with members of the Graduate Teaching Committee and Taught Course Committee
14:15-15:00	Meeting with MPhil teaching staff from: <ul style="list-style-type: none">• Engineering for Sustainable Development (ESD)• Nuclear Energy• Industrial Systems, Manufacturing and Management (ISMM)
15:00-15:30	Meeting with teaching staff from the Centres for Doctoral Training (CDTs)
15:30-16:00	Meeting with graduate students representing PGT and PGR programmes
16:00-16:15	Review Committee - Private meeting
16:15-16:45	Meeting with new and early career staff
16:45-17:30	Private meeting of Review Committee to agree findings and discuss feedback
17:30-18:00	Meeting with the Head of Department and Deputy Heads