The University of Edinburgh

Internal Periodic Review 2018/19

Teaching Programme Review of Engineering

20 & 21 February 2019

Final Report

Section A- Introduction

1. Scope of the review

Range of provision considered by the review (listed in Appendix 1)

2. The TPR of Engineering consisted of:

- The University's remit for internal review (listed in Appendix 2)
- The subject specific remit for the review, consisting of the following items**:**

Undergraduate Curriculum with the sub themes:
- Assessment and feedback,
- Open ended projects,
- Years 1 and 2 structure.

Student Support
Grouping community, health and wellbeing together. It was noted that the theme of community also permeates a number of the items above around the structure of years 1 & 2 and the open ended projects.

Scale Scope and Delivery of PGT programmes with sub themes
- Advantages and disadvantages of co-delivering Undergraduate (UG) and Postgraduate Taught (PGT) courses
- Weighting and workload of Semester 1 PGT courses
- Could more design be added to the curriculum?
- Review of Research Methods teaching across all programmes, could this be standardised
- Creation and resourcing of new Programmes

- The Reflective Report and additional material provided in advance of the review (listed in Appendix 3)
- The visit by the review team including consideration of further material
- The final report produced by the review team
- Action by the School and others to whom recommendations were remitted following the review

3. Membership of review team

Convener	Dr Heather McQueen, School of Biological Sciences
External Member	Dr David Harle, University of Strathclyde
External Member	Denise Neill, Shell UK Limited
External Member	Jack Otter, Denis Ferranti Group
External Member	Dr Andrew Phillips, Imperial College
Internal Member	Dr Roberto Rossi, The Business School
Student Member	Abigail Gardner, School of GeoSciences
Review Team Administrator	Gillian Mackintosh, Academic Services

4. Situation of School within the College

The School of Engineering is one of seven Schools in the College of Science and Engineering.

5. Physical location and summary of facilities

The School of Engineering is one of the largest in the University, comprising over 350 staff. There are currently 1,716 undergraduate students enrolled with a further 178 taught postgraduates.

6. Date of previous review

The previous review took place on the 8 & 9 November 2012

7. Reflective Report

The report was primarily written by the TPR Liaison (Stephen Warrington), the Director of Learning and Teaching (Professor Tim Stratford), the Discipline Programme Managers (Dr Maria-Chiara Ferrari, Dr Antonis Giannopoulos, Dr Alister Hamilton and Dr Hannah Chalmers) and the Teaching Services Manager (Laura Smith), with inputs from several others in the School.
The report was signed off by the Head of School Professor Conchúr Ó Brádaigh.

The School tried to engage with the Students' Association School Representative and the Senior Disciplines Representatives to construct the subject specific remit Items. Initial contact was enthusiastically received but no items were suggested.
The report was sent to the Students' Association School Representative for comment. It was noted that the report accurately reflected the structure of the school and the future plans for the school were welcomed.

Section B - main report

1 Strategic overview

1.1 The School is divided up into four Engineering Disciplines: Chemical Engineering, Civil and Environmental Engineering, Electronics and Electrical Engineering, and Mechanical Engineering.

1.2 Since the last TPR, there has been significant restructuring within the School to enhance teaching and learning and the student experience.

In 2013/14, Directors of Discipline (DoD) were appointed with these roles supported by a Discipline Programme Manager (DPM).

A new Head of School was appointed in 2018, leading to an external review of the structure and governance of the School.
At the same time, a number of roles were revised or created; the Director of Teaching role was refined and renamed to Director of Teaching and Learning, in August 2018, a Technology Enhanced Science Education (TESE) Chair was appointed and a new Deputy Head of School appointed in January 2019.

The Teaching Support Office within the Engineering Teaching Organisation (ETO) was reorganised in February 2018 to provide greater discipline identity and a physical presence within each discipline alongside each Director of Discipline.

The review team was impressed with the commitment and enthusiasm shown by the staff and students that they met with during the review.

1.3 The School is clearly embarking on a time of transformation as the new structure becomes embedded and as it undertakes the undergraduate curriculum review, and the review team **commends** the proactive approach by the School to enhance the student experience.
At the same time the new structure in the ETO appears to be working well and the review team **commends** the approach to support the DoD and DPM roles to strengthen and support the student voice and towards building community.

1.4 At the same time, it was clear from discussions during the review that there is a need for the School to reflect and develop a strategic vision. There is a need to establish clarity around what is unique about an Edinburgh Engineering student which, in turn, will help guide and inform the forthcoming curriculum review.
The review **recommends** that this exercise is prioritised to enable this vision to inform other areas of development.

In addition, the review team **recommends** that the role of the TESE Chair is carefully embedded via definable objectives, with both near and long term deliverables, together with support for growth and dissemination of outcomes, and clarity on integration of the role within the School management structure. The review team **recommends** that the aims and objectives of the role are widely communicated to staff at all levels to facilitate opportunities for staff to engage with initiatives.

1.5 The review team suggests that input from an external partner is sought to ensure that graduate attributes are evidence based, and that the vision is coherent and widely communicated at all levels of the School; it was evident during discussions that both staff and student bodies are not clear on the School's vision.

2. Enhancing the student experience

2.1 Supporting students in their learning

2.1.1 The School operates within the framework of the Personal Tutoring statement and is conscious of the need to support students at all stages of the student journey and is **commended** for its commitment to student support. The review team noted an example where the MSc Programme Director acted as a point of contact for students from pre-arrival, to acceptance of offer through to welcome week providing consistency throughout the induction process.

2.1.2 The Student Support Office complements the Personal Tutor system and there was evidence of a strong and supportive relationship with the Senior Personal Tutor.
The group of Personal Tutors the review team met were committed to supporting the student body; academically and/ or pastorally.

2.1.3 The Student Support Office makes use of the Engagement Monitoring tool to record student attendance. The Senior Personal Tutor is notified where there are attendance issues for follow up with the student.
The Student Support Officer roles were highly thought of by the Personal Tutors especially in terms of the administrative support offered. It was suggested that there is a need for these roles to be given more professional recognition by the University.

2.1.4 On the whole, students feel supported and highlighted various ways in which they receive support including programme directors, personal tutors, and the student support office.
However, there were some examples noted during discussions with students of those who had not had a positive experience; inconsistences around frequency and timing of Personal Tutor meetings; lack of appreciation of how the role of the Personal Tutor and student support office complement each other.

The University is due to undertake a single review of the student support ecosystem (all aspects of student facing support including Personal Tutors and Student Support Teams) starting in April 2019, therefore the comments noted above will be reported to the working group for consideration.

2.1.5 Problems with accessibility of student support services at the King's Buildings campus were noted; the Students' Association Advice Place has limited hours and the Chaplaincy listening service is located in the central area. The review team **recommends** that the University and Students' Association consider ways to increase accessibility of existing services and review possible integration of support services currently based at the central campus.

2.2. Listening to and responding to the Student Voice

2.2.1The School is committed to enhancing the student voice and this is reinforced through the inclusion of Community as one of the School remit items.

2.2.2 The review team **commends** the recently restructured Engineering Teaching Office which appears to be working well. It is hoped that the new structure will better support the DoD and the DPM roles and will enable sessions with programme representatives and students to take place to discuss matters such as student survey results and action plans. This in turn, should help to develop a sense of community and improve the student voice.

2.2.3 On the whole, students described a positive sense of community within their particular subject cohorts; this was particularly evident amongst the postgraduate taught students.
Within the undergraduate student body, there was a sense that the competitive culture largely created as a result of coursework marking structure and open ended projects, eroded the sense of community established in early years.
Nevertheless, students described some examples which helped to build community including working together during common first year courses and an informal peer review

system in Mechanical Engineering where students took the initiative to develop a SharePoint site to share past paper examples.

Students expressed a desire for more extra –curricular activities, project work and activities to further help develop a sense of community.

2.2.4 During discussions, staff highlighted various mechanisms for students to provide feedback. Students confirmed awareness of these systems, including Student Staff Liaison Committees (SSLC), the Student Representative system, a Surgery Hours system and mid-course feedback.

2.2.5 However, the review team noted a number of inconsistencies around the surgery hours system and the student representation system.

Students expressed mixed views on surgery hours. Despite some students finding this a useful mechanism for receiving feedback, other students felt that the arrangement did not lend itself to being a collegiate process for building community between the students nor the most effective use of time for students and staff.
It was noted that the Engineering Teaching Office endeavour to identify slots for surgery hours when students are available. Nevertheless, some students suggested that the surgery hour be formally timetabled rather than optional, to make attendance better.

The review team suggest that the School review the effectiveness of surgery hours system to ensure that opportunities to build community between staff and students are not overlooked.

2.2.6 Overall, the Postgraduate (PGT) student experience appears to be largely positive. The PGT student reps reported meeting with the Programme Director once a semester ahead of the SSLC meeting which was useful and timely. They also reported that they were aware of changes made as a result of their feedback.

2.2.7 Some undergraduate students expressed dissatisfaction with the new representation system in that there appears to be no adequate established method for representatives to feed outcomes back to other students, despite there being a mandate to do so.

The review team suggest that the School follow up with the Students' Association around reinforcing expectations and support for the Programme Representative role.

In addition to publishing SSLC minutes on the ETO Student Hub, robust and well publicised mechanisms for closing the loop by feeding back outcomes to the student population are required.

2.3 Learning and Teaching

2.3.1 The School is about to embark on a comprehensive curriculum review, and as such identified the undergraduate curriculum as one of the subject specific remit items.
One major feature that the School wishes to consider in this review is the structure of years 1 & 2 of the degree programmes. Although the review will predominantly focus on the undergraduate curriculum, consideration will also be given to the postgraduate taught curriculum due to some overlap in 5th year and postgraduate course content.

2.3.2 During the review the students spoke positively about the format of the Engineering 1, cross-discipline core course, noting that the structure works well, provides flexibility and a positive sense of community, particularly during the workshops. The students noted that the flexibility afforded by keeping options open in first year was appreciated and should not be lost in any re-design. **This is recognised as a distinctive aspect and key**

strength of the Edinburgh Engineering experience and is highlighted as an example of good practice.

Students reported that the workload in first year was not excessive, allowing them to adjust to university life and form community connections.
The home students (Scottish and RUK students) appreciated the consolidation in first year, particularly in maths. However, some of the EU (baccalaureate) students felt that first year was more of a repeat of their school education, despite the high academic entry requirements.

Students suggested the introduction of an extra component (digital design for example) into first year as part of the curriculum review to provide an engaging activity rather than an academically demanding exercise to allow community ties to develop whilst providing something interesting for less academically challenged students, such as those holding Baccalaureate degrees.

The School also identified open-ended projects as one of the subject specific remit items. The Civil Engineering design thread has been well developed and reported about externally through an article in the Structural Engineer and is **recognised as an example of good practice**. In addition, students felt that it taught them skills beyond technical engineering such as writing and preparing briefs and understanding client needs.

A further example of good practice noted during the review includes the Mechanical Engineering placement where students are asked to complete a professional review to evidence how their placement allows them to satisfy the competencies required to become a chartered engineer. This practice could be extended to other projects undertaken within other sub-disciplines.

The review team **recommends** that students are engaged by and involved in the curriculum review.

2.3.3 The review team suggests that Research Methods Teaching could be introduced across all programmes, taught across disciplines, possibly in the form of mini projects. It is also suggested that the School encourage students to engage with existing expertise within the wider University around research and digital skills, e.g. library services. It is hoped that this will not only enhance student employability skills but could also lead to enhancing a sense of community amongst staff and students.
The review team **recommends** that the curriculum review also takes into account Widening Participation students (WP) and underperforming students in considering engagement with optional aspects such as extra-curricular activities.

2.3.4 Careers Services support is integrated into the curriculum in a number of ways including sessions tailored for Engineering students and the School is **commended** for its approach in supporting students in this way. Although students appreciated these interventions, the review team suggest timetabling these activities more widely in order to embed across the disciplines. The review team **recommends** that the School considers incorporating inter-disciplinary projects into all years, to provide students with increased experience of working on projects. At the same time, consider incorporating formal teaching of teamwork skills into the first year curriculum.

2.3.5 As part of its commitment to strengthening the curriculum, the School recently recruited a Chair of Technology Enhanced Science Education. The main aim of the role is to lead further development and wider employment of new technology enhanced learning methods. The review team **commends** the School for their forward thinking approach in making this appointment.
However, during discussion with staff there appeared to be a disconnect with the aims and objectives of the role and wider staff engagement. [See section 1.4]

2.3.6 The review team **commends** the various social activities that are in place to encourage a sense of community between staff and students across all disciplines. At the same time, sense of community amongst staff appears to be disjointed. It was not entirely evident as to the reasons behind this. However, staff suggested that opportunities to share practice within and between each discipline would be welcomed and may encourage a sense of belonging.
Although it was recognised that some ad-hoc opportunities did exist, a more structured or formal approach would be welcomed. Some disciplines reported that an away day format had worked well in the past and could be a useful mechanism for sharing practice/ experience as well as practical approaches to teaching.
The School acknowledged that improvements are required to recognise good teaching and positively reinforce this. At the same time, they recognised that unsatisfactory teaching practice also needs to be addressed.
Staff commented on instances where changes made to a course or programme, resulting in a positive impact on the student experience were not shared and discussed more widely across the School.

The review team **recommends** that the School makes space (both within workload allocations and by providing support, recognition and reward) for innovative teaching practice and considers how teaching practice can be shared across the School.

2.3.7 Postgraduate students were very positive about their experience and a sense of community was evident amongst the students that met with the review team. In addition, they felt that the co-delivery of UG and PGT courses was working well and the weighting and workload of semester 1 courses was appropriate. Nevertheless some MSc students noted that there may be instances where students are missing out on the benefits of small class sizes such as more in depth discussion. It is suggested that the School considers this in the curriculum review as to whether seminars may be necessary alongside larger lectures

2.3.8 The review team **commends** the arrangements in place for organised and timely allocation of teaching to staff.

2.3.9 The School is **commended** for their plans to introduce a PGT forum for Postgraduate Directors as a mechanism for sharing practice.

2.3.10 The review team suggest that the College Curriculum Approval Board is proactively informed of and engaged with developments, which will support the School in curriculum development and college-level approval activities as required.

<u>2.4 Assessment and Feedback</u>

2.4.1 Assessment and feedback was identified by the School as a key feature of the review as part of the Undergraduate Curriculum subject specific remit item. In addition, the School has demonstrated a commitment to enhancing assessment and feedback practices in its participation in the LEAF (Leading Enhancement in Assessment and Feedback) Project. The review team **recommends** that the School further reflect on the outcomes identified through its recent engagement with the LEAF project

2.4.2 Students expressed mixed experiences around feedback. Some students reported that they felt they had not received constructive feedback until 4th year, whereas others reported instances of receiving positive feedback throughout their academic journey.

Students noted a lack of clarity around expectations of their assessed work, and difficulties in trying to ascertain ways in which to improve. Some students expressed an imbalance around the amount of credit and expected time allocated to coursework versus the actual workload and time required. Some students felt that the current feedback structures did not provide many opportunities to improve, e.g. marks were given without

feedback to suggest where improvements could be made for the next piece of coursework.

Students suggested that it would be more useful to receive feedback during the draft stage rather than at the end of a project, to receive feedback that would help with future work and would welcome opportunities to have comments or discussions on structure and not necessarily on content of their work.
The review team suggests that the School consider adopting an optional feedback template with sections for 'things done well' and 'things to improve' to provide standards in terms of what students can expect from feedback.

2.4.3 Some students reported that facilitated discussion sessions led by PhD students were useful and brought a sense of group understanding rather than an individual learning experience.
In addition, there was a mixed response around the report writing courses. Some students found them helpful and shared practice with each other. Others were more reluctant to participate; citing the competitive culture that they felt currently exists in the School.

2.4.4 As noted above and in section 2.2.3 there appears to be a number of factors that contribute to the existence of an overly competitive culture amongst students.

During discussions with both students and staff it was evident that marks scaling is a major contributor. It was suggested that, in general, students become very grade motivated as they progress through their studies. Furthermore, students feel their final grade is determined by their position within the class rather on the absolute merits of their own work. This appears to be having a detrimental effect on the student experience, in that it creates a barrier to fostering community amongst the student body and creates misconceptions about marking structures.

The review team **recommends** that the School examines their marking policy, and investigates why, in some areas, scaling of marks appears to be happening routinely rather than by exception. Following this exercise, the School should provide clarity to both students and staff on when and why scaling will be used.

In addition, it is **recommended** that the School review and reflect on feedback provided to students to ensure it is effective, transparent, useful and timely.

The review team **recommend** that the School are clear and transparent about the balance of credits in relation to workload; highlighting other benefits, where appropriate, in order to manage expectations for both students and staff.

2.5 Accessibility, Inclusivity and Widening Participation

2.5.1 The School's Coordinator of Adjustment (CoA) and the Student Support Team provides support to staff around the Accessible and Inclusive Learning Policy.

2.5.2 The School has an established Equality and Diversity Committee and there is a strong motivation in the School to improve gender balance. The School has a long history of engagement with local schools that aims to debunk pre-existing biases about engineering as a male role, generally aimed at third year secondary school pupils. More recently, however, there has been some new engagement activities targeting primary school pupils. The review team heard that female students are willing participants in outreach events in general and also in events where there is a focus on addressing gender imbalance.

2.5.3 The review team **commends** the impending appointment of a Director of Equality which will give more prominence for discussion of gender balance, as well as a focus on Athena Swan.

2.5.4The review team suggests that the School consider the introduction of a strategy on gender balance to review and set out targets. The strategy should be viewed as a tool to assist the School to identify where support from the wider university could be helpful as they work to improve gender balance.

In addition, as part of the work with school pupils to encourage more female applicants, the review team suggests that the School explore ways to collaborate with their industrial partners as well as fully utilise existing industrial connections or external organisations such as EQUATE Scotland. The School should also explore ways to engage alumni in this exercise, promoting them as role models and sharing career journeys.

2.6 Learning environment (physical and virtual)

2.6.1 The review team **recommends** that there is investment in the Maker Space to accommodate and support the growing number of student-led project activities in the School.
The Eng Inn has provided a useful space for students and staff to come together. However the size of the space available does not correlate with the size of the School. Consequently, some staff and students reported that the lack of adequate social space, and the fact that the School is spread over a number of buildings, led to a disconnect between staff and students. They felt that there were limited opportunities for informal interactions.
Some students also reported that the lack of a dedicated student-only space in the School did not help to foster and build community.

2.6.2 The University is proceeding with the design of Phase 1 of the Engineering estate without delay, with a target completion date of June 2022. However, pressure on the physical space remains a significant concern for the School during the development stage. Investment in undergraduate teaching space should continue and on-going refurbishment and investment of laboratories is still required.

2.6.3 The review team suggests that the University Estates' space management group be mindful that essential maintenance and continued upgrade of existing facilities continues during the decommissioning stage.

2.7 Development of Employability and Graduate Attributes

2.7.1 Programmes are accredited by a number of Engineering Institutions and meet the major learning outcomes of these bodies.

2.7.2 It was noted that some courses did not include graduate attributes and skills in the course catalogue information on the Degree Regulations & Programmes of Study DRPS.

2.7.3 Students were positive about the mechanisms in place to support good employer engagement and careers service support. The Careers Consultant and Industry Liaison Manager are **commended** for their collaborative approach in supporting students around careers advice and placement provision. **This is recognised as an example of good practice and it is suggested that this approach is exploited more specifically in the areas of gender balance and widening access.**

2.7.4 The School fosters strong links with industry through placement and work-based learning activity. For example, the School holds a poster day event to discuss opportunities for future placements with potential providers. This involves students who have recently completed a placement showcasing examples of work carried out whilst on placement.

At the same time, the School recognises that more needs to be done to share and promote graduate destinations with students.

Some students noted perceptions that employers place more value in the final degree classification rather than their overall experience and skills.
This does not appear to correlate with anecdotal feedback from industry where breadth of experience and ability appears to carry as much weight as the degree grade when considering graduates for employment.

The review team suggest that the School consider engaging with Industry partners to assist in the curriculum review around enhancing employability and graduate attributes, and include mechanisms to raise student awareness of the importance of graduate attributes.

2.8 Supporting and developing staff

2.8.1 As stated in section 1.2, the School has undergone significant restructuring to strengthen its strategic direction.

The review team **commends** the excellent support that the professional services staff provide to students and staff. The group of professional services staff that met with the review team felt supported in their roles and were encouraged to attend training courses for career development.

2.8.2 However the School recognises that further strategy and planning is required around staff development. In addition to recruiting a high calibre of staff, there is a duty by the School to develop and maximise staff potential. The School have started to discuss a number of ways in which to address this such as identifying teaching skill needs. They are keen to engage with the Institute for Academic Development (IAD) on carrying out a training needs analysis and developing a framework to assess and support staff to meet objectives. To this end, the School is **commended** for its approach and desire to develop its staff.

2.8.3 At the same time, there was some lack of awareness around the number of staff engaging with the Higher Education Academy (HEA), through the Edinburgh Teaching Award, Postgraduate Certificate in Academic Practice (PgCAP), or other CPD. It is understood that the new Deputy Head of School will have responsibility for addressing academic performance and the review team **recommends** that a review of CPD activity is undertaken to establish participation and support for CPD, and to send a clear message that development and performance of staff is a priority for the School.

2.8.4 The review team heard that a number of early career staff have been recruited in recent years and the development of this cohort of staff is also a priority for the School. The review team welcomes the encouragement of staff to engage in sabbatical opportunities to assist with the development for these members of staff.

2.8.5 The review team **commends** the use of the role of Academic Champion for Tutors and Demonstrators (T&D) to review training, support and mentoring provided to T&Ds.

2.8.6 The review team met with a small number of Tutors and Demonstrators who, on the whole, were generally positive about their experience.
They appreciated the opportunity to teach, to make tutorials more useful and meaningful and to enhance the overall student experience.

2.8.7 However, during these discussions, some inconsistencies were noted around training, support and policy expectations.

The T&Ds were aware of the in-house online training. However, there were some contradictions around whether refresher training should be taken, whether training was mandatory and cases of taking on the role before training had been completed.

T&Ds who had recently participated in the training found it to be useful although guidance on laboratory teaching practice was perceived to be too general. However T&Ds did recognise that the inherent variable nature of engineering laboratory practical work made it difficult to provide more task-specific guidance in this general training. Training on 'how to teach' was also perceived to be missing.

T&Ds also reported a variety of experiences in their support and preparation for the role; some reporting a specific session with the course organiser to discuss the session questions ahead of the tutorial, and opportunities to practice the lab session in their own time before the session with students. By contrast, others intimated to feeling unsupported and had to learn by themselves as they took each session.

Again, different experiences were noted around feedback from students; some T&Ds reported that they had received feedback during the semester and that they would also find it useful to see end of course comments. Others noted that they had not received any feedback on their teaching, even over a period as long as 3 years. They felt that this did not provide them with an opportunity to review and reflect on their teaching practice. The desire for feedback was particularly relevant for those who wished to pursue a career in academia.

The T&Ds expressed that they would welcome an opportunity to formally meet with the course organiser to receive feedback on the session and at the same time to offer suggestions/feedback on the course.
There was also some discussion about a perceived imbalance around the time allocated to mark reports and the actual time taken.

A lack of awareness was noted around further training and development opportunities such as Higher Education Academy (HEA) accreditation through level 1 of the Edinburgh Teaching Award.

In line with the Policy for the recruitment, support and development of tutors and demonstrators , the review team **recommend** that the School ensures that T&D tasks allocated are reasonable within the time allocated. In addition, Tutors and demonstrators must not commence their duties until the School has provided them with necessary formal induction on all core aspects of their role. The School could consider a system of noting pre-requisites to teach on any specific course and record that these have been met before starting tutor and demonstrator duties.

In addition, as stated in the policy, feedback makes a valuable contribution to tutors' and demonstrators' experience and development. It is important that tutors and demonstrators receive constructive and relevant feedback on their performance in a timely manner and this feedback may be received through various channels.
Therefore the review team **recommends** that the School considers ways in which T&Ds can receive feedback and how they may provide feedback on their experiences.

The review team **recommend** that the School follow up with the IAD to review T&D training and development opportunities such as the Introduction to Academic Practice course (a Higher Education Academy accredited course aimed at tutors and demonstrators), or level 1 of the Edinburgh Teaching Award.

3. Assurance and Enhancement of provision

3.1 Setting and maintaining academic standards

3.1.1 The School operates within the University Quality Framework and the review team is confident that academic standards are high. Courses and programmes map onto the Scottish Credit and Qualifications Framework (SCQF) level descriptors and to the relevant Quality Assurance Agency (QAA) Subject Benchmark Statement.

External Examiners expressed their satisfaction with academic procedures, assessment and the classification of degrees.

3.1.2 The School has strong links with professional/accrediting bodies and keeps pace with technological change in the subject areas. It is influenced by industry through Industrial Advisory/Liaison Boards which consists of members from companies that cover a broad range of relevant industries and alumni. The School fosters strong relationships with industry through placement and work-based learning activity.

As noted above, programmes are accredited by the relevant professional accrediting bodies (listed in Appendix 5). All of these adhere to UK-SPEC (UK Standard for Professional Engineering Competence), which sets out the competence and commitment required for registration as a Chartered Engineer (CEng). The QAA Engineering Benchmark Statements are aligned with UK-SPEC.

There is active Industrial Advisory Board (IAB) activity within each of the four disciplines, e.g. the Mechanical Engineering Industrial Board restarted in recent years and is closely involved with curriculum development.

Recommendations from accrediting/professional body reviews are responded to through action plans managed by the DoD/DPM and monitored through the annual monitoring process.

3.1.3 The College Office Admissions Team administers admissions for the School. Recruitment is managed by the School's Recruitment Team, the University's Student Recruitment and Admissions Team and Edinburgh Global.

The School is **commended** for the positive offering of 'virtual visiting days' for students who are unable to attend offer- holding visit days

Section C – Review conclusions

Confidence statement

The review team found that the School of Engineering has effective management of the quality of the student learning experience, academic standards, and enhancement and good practice

Key Strengths and Areas of Positive Practice for sharing more widely across the institution

No	Commendation	Section in report
1	The School is clearly embarking on a time of transformation as the new structure becomes embedded and as it undertakes the undergraduate curriculum review, and the review team **commends** the proactive approach by the School to enhance the student experience.	1.3
2	At the same time the new structure in the ETO appears to be working well and the review team **commends** the approach to support the DoD and DPM roles to strengthen and support the student voice and towards building community	1.3 & 2.2.2
3	The Careers Consultant and Industry Liaison Manager are **commended** for their collaborative approach in supporting students around careers advice and placement provision **This is recognised as an example of good practice**	2.7.3
4	Careers Services support is integrated into the curriculum in a number of ways including sessions tailored for Engineering students and the School is **commended** for its approach in supporting students in this way	2.3.4
5	As part of its commitment to strengthening the curriculum, the School recently recruited a Chair of Technology Enhanced Science Education. The main aim of the role is to lead further development and wider employment of new technology enhanced learning methods. The review team **commends** the School for their forward thinking approach in making this appointment.	2.3.5
6	The School is **commended** for its approach and desire to develop its staff.	2.8.2
7	The review team **commends** the excellent support that the professional services staff provide to students and staff	2.8.1
8	The review team **commends** the impending appointment of a Director of Equality which will give more prominence for discussion of gender balance, as well as a focus on Athena Swan	2.5.3
9	The review team **commends** the arrangements in place for organised and timely allocation of teaching to staff.	2.3.8
10	The review team **commends** the use of the role of Academic Champion for Tutors and Demonstrators (T&D) to review training, support and mentoring provided to T&Ds	2.8.5
11	The School is **commended** for their plans to introduce a PGT forum for Postgraduate Directors as a mechanism for sharing practice	2.3.9

12	The School operates within the framework of the Personal Tutoring statement and is conscious of the need to support students at all stages of the student journey and is **commended** for its commitment to student support	2.1.1
13	The review team **commends** the various social activities that are in place to encourage a sense of community between staff and students across all disciplines	2.3.6
14	The School is **commended** for the positive offering of 'virtual visiting days' for students who are unable to attend offer holding visit days	3.1.3
15	During the review the students spoke positively about the format of the Engineering 1, cross-discipline core course, noting that the structure works well, provides flexibility and a positive sense of community, particularly during the workshops. The students noted that the flexibility afforded by keeping options open in first year was appreciated and should not be lost in any re-design. **This is recognised as a distinctive aspect and key strength of the Edinburgh Engineering experience and is highlighted as an example of good practice.**	2.3.2
16	The School also identified open-ended projects as one of the subject specific remit items. The Civil Engineering design thread has been well developed and reported about externally through an article in the Structural Engineer and is **recognised as an example of good practice**. In addition, students felt that it taught them skills beyond technical engineering such as writing and preparing briefs and understanding client needs.	2.3.2
17	**A further example of good practice** noted during the review includes the Mechanical Engineering placement where students are asked to complete a professional review to evidence how their placement allows them to satisfy the competencies required to become a chartered engineer. This practice could be extended to other projects undertaken within other sub-disciplines.	2.3.2

Recommendations for enhancement/Areas for further development

Priority	Recommendation	Section in report	Responsibility of
1	The review **recommends** that there is a need for the School to reflect and develop a strategic vision and that this exercise is prioritised to enable this vision to inform other areas of development	1.4	Head of School
2	The review team **recommends** that the School examines their marking policy, and investigates why, in some areas, scaling of marks appears to be happening routinely rather than by exception. Following this exercise, the School should provide clarity to both students and staff on when and why scaling will be used.	2.4.4	Head of School
3	It is **recommended** that the School review and reflect on feedback provided to students to	2.4.4	Head of School

	ensure it is effective, transparent, useful and timely		
4	The review team **recommends** that the School makes space (both within workload allocations and by providing support, recognition and reward) for innovative teaching practice and considers how teaching practice can be shared across the School	2.3.6	Head of School
5	The review team **recommend** that the School ensures that T&D tasks allocated are reasonable within the time allocated. In addition, Tutors and demonstrators must not commence their duties until the School has provided them with necessary formal induction on all core aspects of their role. The School could consider a system of noting pre-requisites to teach on any specific course and record that these have been met before starting tutor and demonstrator duties.	2.8.7	Head of School
6	The review team **recommends** that the School considers ways in which T&Ds can receive feedback and how they may provide feedback on their experiences	2.8.7	Head of School
7	The review team **recommend** that the School follow up with the IAD to review T&D training and development opportunities such as the Introduction to Academic Practice course (a Higher Education Academy accredited course aimed at tutors and demonstrators), or level 1 of the Edinburgh Teaching Award	2.8.7	School in conjunction with IAD
8	The review team **recommends** that a review of CPD activity is undertaken to establish participation and support for CPD, and to send a clear message that development and performance of staff is a priority for the School	2.8.3	Head of School
9	In addition, the review team **recommends** that the role of the TESE Chair is carefully embedded via definable objectives, with both near and long term deliverables together with support for growth and dissemination of outcomes, and clarity on integration of the role within the School management structure. The review team **recommends** that the aims and objectives of the role are widely communicated to staff at all levels to facilitate opportunities for staff to engage with initiatives	1.4	Head of School
10	The review team **recommends** that students are engaged by and involved in the curriculum review	2.3.2	Head of School
11	The review team **recommends** that the curriculum review also needs to take into account	2.3.3	Head of School

	Widening Participation students (WP) and underperforming students in considering engagement with optional aspects such as extra-curricular activities.		
12	The review team **recommends** that the School considers incorporating inter-disciplinary projects into all years, to provide students with increased experience of working on projects. At the same time, consider incorporating formal teaching of teamwork skills into the first year curriculum	2.3.4	Head of School
13	The review team **recommends** that the University and Students' Association consider ways to increase accessibility of existing services and review possible integration of support services currently based at the central campus	2.1.5	Deputy Secretary Student Experience and Edinburgh University Students' Association
14	The review team **recommends** that the School further reflect on the outcomes identified through its recent engagement with the LEAF project	2.4.1	Head of School
15	The review team **recommends** the investment in the Maker Space to accommodate and support the growing number of student-led project activities in the School	2.6.1	Head of School
16	The review team **recommend** that the School are clear and transparent about the balance of credit in relation to workload, highlighting other benefits where appropriate, in order to manage expectations for both students and staff.	2.4.4	Head of School

Suggestions for noting

If an issue is minor but the review team nevertheless wants to flag it as a potentially useful action, it will be couched as a suggestion rather than a formal recommendation. Suggestions are not tracked in onward reporting.

No	Suggestion	Section in report
1	The review team suggests that input from an external partner is sought to ensure that graduate attributes are evidence based, and that the vision is coherent and widely communicated at all levels of the School; it was evident during discussions that both staff and students are not clear on the School's vision	1.5
2	It was suggested that there is a need for the Student Support Officer roles to be given more professional recognition by the University	2.1.3
3	The review team suggest that the School review the effectiveness of the surgery hours system to ensure that opportunities to build community between staff and students are not overlooked	2.2.5
4	The review team suggest that the School follow up with the Students' Association around reinforcing expectations and support for the Programme Representative role	2.2.7
5	The review team suggests that Research Methods Teaching could be introduced across all programmes, taught across disciplines, possibly in the form of mini projects. It is also suggested that the School encourage	2.3.3

	students to engage with existing expertise within the wider University around research and digital skills e.g. library services	
6	The review team suggest timetabling careers activities more widely in order to embed across the disciplines	2.3.4
7	The review team suggest that the College Curriculum Approval Board is proactively informed of and engaged with developments, which will support the School in curriculum development and college-level approval activities as required	2.3.10
8	The review team suggests that the School consider the introduction of a strategy on gender balance to review and set out targets	2.5.4
9	In addition, as part of the work with school pupils to encourage more female applicants, the review team suggests that the School explore ways to collaborate with their industrial partners as well as fully utilise existing industrial connections or external organisations such as EQUATE Scotland. The School should also explore ways to engage alumni in this exercise, promoting them as role models and sharing career journeys	2.5.4
10	The review team suggests that the University Estates' space management group be mindful that essential maintenance and continued upgrade of existing facilities continues during the decommissioning stage	2.6.3
11	The review team suggest that the School consider engaging with Industry partners to assist in the curriculum review around enhancing employability and graduate attributes, and include mechanisms to raise student awareness of the importance of graduate attributes.	2.7.4

Appendices

Appendix 1: List of Programmes

Programme Name
Chemical Engineering with Management (BEng Hons)
Chemical Engineering with Management (MEng Hons)
Chemical Engineering (BEng Hons)
Chemical Engineering (MEng Hons)
Advanced Chemical Engineering (MSc) - 1 Year
Civil Engineering (BEng Hons)
Civil Engineering (MEng Hons)
Structural Engineering with Architecture (BEng Hons)
Structural Engineering with Architecture (MEng Hons)
Structural and Fire Safety Engineering (BEng Hons)
Structural and Fire Safety Engineering (MEng Hons)
VS Fire Safety Engineering (MSc) (1 Semester)
VS Fire Safety Engineering (MSc) (Year 2 - Semester 3)
VS Fire Safety Engineering (MSc) (Year 2 - Semester 4)
VS Fire Safety Engineering (MSc) Semesters 3 and 4
Structural and Fire Safety Engineering (MSc)
Sensor and Imaging Systems - (MSc) (Full-time)
Signal Processing and Communications (MSc) (Full-time)
Electronics and Computer Science (BEng Hons)
Electronics and Computer Science (MEng Hons)
Electronics and Electrical Engineering (BEng Hons)
Electronics and Electrical Engineering (MEng Hons)
Advanced Power Engineering (MSc) - 2 Years (Full-time)
Electronics (MSc)
Electrical Power Engineering (MSc) - 1 Year (Full-time)
General Engineering (Year 1 only)
Sustainable Energy Systems (MSc)
Electrical and Mechanical Engineering (BEng Hons)
Electrical and Mechanical Engineering (MEng Hons)
Mechanical Engineering (BEng Hons)
Mechanical Engineering (MEng Hons)

Appendix 2 – University remit 2018/19

The University remit provides consistent coverage of key elements across all of the University's internal reviews (undergraduate and postgraduate).

It covers all credit bearing provision within the scope of the review, including:

- Provision delivered in collaboration with others
- Transnational education
- Work-based provision and placements
- Online and distance learning
- Continuing Professional Development (CPD)
- Postgraduate Professional Development (PPD)
- Provision which provides only small volumes of credit
- Joint/Dual Degrees
- Massive Open Online Courses MOOCs (even if non-credit bearing)

1. **Strategic overview**
   The strategic approach to:

   - The management and resourcing of learning and teaching experience,
   - The forward direction and the structures in place to support this.
   - Developing business cases for new programmes and courses,
   - Managing and reviewing its portfolio,
   - Closing courses and programmes.

2. **Enhancing the Student Experience**
   The approach to and effectiveness of:

   - Supporting students in their learning
   - Listening to and responding to the Student Voice
   - Learning and Teaching
   - Assessment and Feedback
   - Accessibility, Inclusivity and Widening Participation
   - Learning environment (physical and virtual)
   - Development of Employability and Graduate Attributes
   - Supporting and developing staff

3. **Assurance and Enhancement of provision**
   The approach to and effectiveness of maintaining and enhancing academic standards and quality of provision in alignment with the University Quality Framework:

   - Admissions and Recruitment
   - Assessment, Progression and Achievement
   - Programme and Course approval
   - Annual Monitoring, Review and Reporting
   - Operation of Boards of Studies, Exam Boards, Special Circumstances
   - External Examining, themes and actions taken
   - Alignment with SCQF (Scottish Credit and Qualifications Framework) level, relevant benchmark statements, UK Quality Code
   - Accreditation and Collaborative activity and relationship with Professional/Accrediting bodies (if applicable)

Appendix 3 Additional information considered by review team

Reflective Report & Appendices: External Review of Structure and Governance Recommendations Engineering LEAF report Nov 2018 Deputy Head of School job description Director of Discipline job description Director of Teaching and Learning job description
School Quality Assurance Reports: (2015/16 – 2017/18) School QA Model
External Examiners Summary reports: Undergraduate (2015/16 - 2017/18) Postgraduate (2015/16 – 2017/18)
School organisation chart
Current Teaching Organisation staff information
Programme Handbooks: MSc in Advanced Chemical Engineering MSc Advanced Power Engineering MSc Electronics MSc Electrical Power Engineering MSc Structural & Fire Safety Engineering MSc Sustainable Energy Systems MSc Signal Processing & Communications UG Handbook
Programme specification information: http://www.drps.ed.ac.uk/18-19/dpt/drps_eng.htm
Statistical information: Completion rate of entrants report UG Completion rate of entrants report PG Course results UG Course results PG Entrants report UG Entrants report PG Progression report UG Student applications UG Student applications PG Students Studying Abroad report (2016/17 & 2017/18) Widening Participation Equality Diversity Monitoring and Research Committee (EDMARC) Student report (2017) Undergraduate Degree Classification Report (April 2018) Background Data for First Destination Statistics (DHLE Survey) UG Background Data for First Destination Statistics (DHLE Survey) PG
National Student Survey (NSS) results and reflection 2017-2018
Postgraduate Taught Experience Survey (PTES) results and reflection 2017-2018
Accreditation reports: Chemical Engineering Civil & Environmental Electronics and Electrical

Mechanical Report MSc Sustainable Energy
Student Staff Liaison Committee meeting minutes: 2017-18 Semester 1 and Semester 2
Internal Audit of School of Engineering Tutors and Demonstrators process report and response
Link to Carbon capture Massive Open Online Course (MOOC)
University of Edinburgh Standard Remit 2018/19
Subject Specific Remit

Appendix 4 Number of students

Total Number of Undergraduate Students by Programme by Year (October 2018)

	Year of Programme					
	1	2	3	4	5	Grand Total
Chemical Engineering	94	92	92	83	41	402
Chemical Engineering with Management	3	15	22	19	21	80
Civil Engineering	43	65	58	43	15	224
Structural and Fire Safety Engineering	1	1		3	7	12
Structural Engineering with Architecture	20	15	7	16	14	72
Electrical Engineering with Renewable Energy		4	9	2	1	16
Electronics				1		1
Electronics and Computer Science	22	19	18	1	3	63
Electronics and Electrical Engineering	42	31	54	53	23	203
Electronics and Electrical Engineering with Management		1	4	6	2	13
Electronics and Software Engineering	1	5			1	7
Electrical And Mechanical Engineering	26	24	21	16	9	96
Engineering for Sustainable Energy			1	1	1	3
Mechanical Engineering	102	91	76	72	50	391
Mechanical Engineering with Management		6	11	16	4	37
Mechanical Engineering with Renewable Energy	2	10	18	13	5	48
Engineering Not Known (1st Year)	40	1				41
Engineering (IFP)	1					1
Ordinary Sciences			6			6
Grand Total	397	380	397	345	197	1716

Total Number of Taught Postgraduate Students by Programme by Fee Category (October 2018)

	Overseas	Home
Electronics	20	0
Signal Processing and Communications	42	0
Structural and Fire Safety Engineering	7	1
Sustainable Energy Systems	39	16
IMFSE	11	0
Advanced Chemical Engineering	15	5
Electrical Power Engineering (1 Year)	17	2
Advanced Electrical Engineering (Year 1)	3	0
Advanced Electrical Engineering (Year 2)		
Sensors and Imaging Systems	8	7
Sub Total	162	31
Total	193	

Appendix 5: Accreditations

IChemE – The Institution of Chemical Engineers;
IET – Institution of Engineering and Technology;
JBM – Joint Board of Moderators (Institution of Civil Engineers, the Institution of Structural Engineers, the Chartered Institution of Highways and Transportation and the Institute of Highway Engineers);
IMechE - Institution of Mechanical Engineers;
EI - Energy Institute.