



**University College Dublin**

**Quality Improvement Plan**

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UCD School of Electrical, Electronic and Communications Engineering

August 2014

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## 1. Introduction

A Periodic Quality Review of the UCD School of Electrical, Electronic & Communications Engineering was carried out by a Review Group over the time period 25<sup>th</sup>- 28<sup>th</sup> November 2013. Subsequent to this, a report was issued which was approved by UCD's Governing Authority at its meeting in March 2014. The report was considered in detail at a School Meeting at that time, and it was agreed that several useful recommendations had been provided as a result of the exercise. Overall, the School was extremely pleased with the very positive tone of the Report, affirming the quality and excellence of its activities across a wide spectrum including education, research and wider contributions.

In accordance with UCD Quality Review procedures, a formal Quality Improvement Plan (QIP) is now put in place, involving a careful review of the recommendations made, and an action plan for implementation. The present document represents the first outcome of that process. A Quality Improvement Committee was established to formulate the QIP, with the following composition and primary initial areas of responsibility:

Chair: Tom Brazil, Head of School  
Oran O'Rua/Liam Carroll (Staff and Facilities)  
Mark Flanagan (Teaching, Learning & Assessment)  
Tom Brazil (Organisation & Management, Research Activity)  
(All) Management of Quality & Enhancement  
Rick Watson (Support Services, External Relations)  
Clare Davidson  
Ciara O'Connor

Each person prepared draft responses to the recommendations within their areas of responsibility. Based on these, a preliminary draft version was circulated to all members of the Quality Improvement Committee for their comments, and a final draft was then approved by all members of the committee. This draft was circulated to all members of the School for further comments and revisions, before a final version was submitted to the UCD Quality Office.

### Categories

1. Recommendations concerning academic, organisational and other matters which are entirely under the control of the unit
2. Recommendations concerning shortcomings in services, procedures and facilities which are outside the control of the unit
3. Recommendations concerning inadequate staffing, and/or facilities which require recurrent or capital funding

### Timescale

- A. Recommendation already implemented
- B. Recommendations to be implemented within one year
- C. Recommendations to be implemented within five years
- D. Recommendations which will not be implemented

Report	RG Recommendation	Category (see list above)	Action Taken/Action Planned/Reason for Not Implementing	Timescale (see list above)
<b>ORGANISATION AND MANAGEMENT</b>				
2.10	The Review Group recommends that the School considers improving its publicity of engineering as an important discipline to the outside world in order to increase future student numbers and industrial support.	1	The School supports this recommendation, although actual implementation is not entirely within its control as the marketing of "Engineering" is considered to be a function of the UCD College of Engineering & Architecture. This recommendation will be communicated to the CEA Marketing Committee. In addition, the School is currently organising a major review of its website using external assistance, to improve its attractiveness to students and the outside world.	A
2.11	The Review Group recommends that the School's management team monitors and adjusts the profiling of the student population to prevent an overloading of the teaching assistant (TA) pool in the light of planned increases in the UG student population.	1	This will be done as far as possible. The school faces a large increase in undergraduate numbers in coming years, coupled with a static or even slightly falling cohort of TAs from existing staff. One positive factor since the Review Group's visit is the recent confirmation that SFI will fund the new research Professor that the School has devoted considerable effort to recruiting over the past 18 months. This award is valued at close to 5M€ over 5 years, and much of	B/C

			the funding will go towards the recruitment of up to 13 new PhD students. This will significantly improve availability of TA capacity, especially in Electronic & Computer Engineering, but it may take a year or two for the effects to be fully visible.	
2.12	The RG recommends that the School's management team encourages an increase in the number of research active staff. While this is certainly meritorious in it's own right, it will also lead to an increase in the research student population, the size of the TA pool and hence a reduction in the teaching loads of the academic staff.	1	Please see response to previous recommendation. In addition, the School has been successful in securing approval at university level for a new 5-year appointment in Biomedical Engineering. This post was advertised in Summer 2014, and a strongly research-active candidate has been recommended for appointment. In addition through the Energy Institute, there are plans for at least one, and perhaps 2, new research-active academic appointments in Intelligent Energy and Energy Systems. All of these measures will improve the proportion of highly research-active staff.	B
2.13	The RG recommends that a formalised workload allocation and monitoring framework is developed. While short-term controversy might be expected, a settled system will improve the perception of fairness and openness in the assignment of teaching and administrative tasks.	1	This recommendation is accepted. The School operates an informal workload allocation framework at present, and it should be noted that because of small staff numbers and limited capacity in critical areas (e.g. Biomedical Engineering), there are limits to how far a formal system can be taken. There was an effort at College level to create a harmonised formal workload model across the Engineering disciplines in the Academic Year 2013/14, but this appears now to have been discontinued, so the School will have to develop its own system over the coming year.	B
2.14	In the opinion of the Review Group the resource assignment mechanisms of the University are overly complex and at the root of wide-spread discontentment within the academic staff. Consideration should be given to simplifying the RAM and/or to improving the communication of the model.	2	The School strongly supports this and the following series of related recommendations. Since the visit of the Review Group, the President has indicated that a university-wide review of the operation of the RAM model will be conducted in the Academic Year 2014/15.	B
2.15	The Review Group recommends that the parameters within the RAM are reviewed on an annual basis by a finance committee that represents all the Colleges within the	2	See comments under 2.14 above.	B

	University.			
2.16	The Review Group recommends that the RAM is made available to all the units within the University so that they can use it for financial planning and “what if” type studies.	2	See comments under section 2.14 above.	B
2.17	The Review Group recommends that every attempt is made to reduce the cost of the UCD central services.	2	Again, the School supports the thrust of this recommendation, recognising that high quality and efficient support services are vital if the School is to achieve its mission. However, support costs appear to have grown very rapidly in recent years, and these are ultimately charged back to the Schools. The School will communicate this recommendation to the new Principal of the College of Engineering & Architecture, who is a member of the University Management Team.	C
2.18	The Review Group recommends that administration of academic consulting is put on a formal and support oriented basis so as to encourage an increase of UCD administered consulting. In the opinion of the Review Group the UCD charge of the consulting income stream is far too high and should be adjusted down to the 10 to 20% range.	2	The School would support this recommendation. The recommendation will be taken forward to the university-level Research, Innovation and Impact Group.	C
<b>STAFF AND FACILITIES</b>				
3.5	While the percentage of research active staff within the School is above the University average, the Review Group recommends that every effort is made to facilitate further improvement in this area.	1	Please see the comments under 2.11 and 2.12 above.	B

3.6	The Review Group recommends that the planned new appointments in the Beijing Dublin International College (BDIC) go ahead as soon as possible.	2/3	A new appointment related to BDIC was subsequently approved by the university, and an appointment made. That person will begin in Beijing in September 2014. A further (third) appointment has recently been approved and is currently being advertised, with an expected start-date of 01/01/2015.	A/B
3.7	The Review Group supports the two proposed appointments of the Professor of Intelligent Energy Systems and the professor of Electronic Circuits.	3	As noted under 2.11 above, appointment to the Professorship of Electronic Circuits has successfully concluded. The appointment to the Professorship of Intelligent Energy Systems is proving extremely difficult, due to an international shortage of suitably-qualified candidates, as well as unattractive and inflexible salary conditions that are a result of current Government policy and outside the control of the university. However, efforts are continuing assisted by an external professional recruitment agency.	A
3.8	The Review Group recommends that the School moves appointment of new members of academic staff in the biomedical and connected health areas. If this is done carefully, these appointments should result in a net improvement in the School's bottom line.	3	The School has been successful in securing approval at university level for a new 5-year appointment in Biomedical Engineering. This post was advertised in Summer 2014, and a strongly research-active candidate has been recommended for appointment. A further appointment in Biomedical/Connect Health area is still considered by the School as urgently necessary to achieve sufficient critical mass, and this will be progressed through the College Executive.	B
3.9	The Review Group recommends that the School moves towards treating the TA population as a core element of the teaching resource rather than as an opportunistic "add on". This change would involve increasing the population, introducing a "fit-for-purpose" selection process and providing them with training.	1	The Teaching Assistant population is regarded as a key component in the delivery of the School's teaching commitments, and every effort is made to match the Teaching Assistants' research background with the modules to which the Teaching Assistants are assigned. The School has committed to improving the training of Teaching Assistants, through the development of a dedicated 'Teaching Assistant' training module to which all Teaching Assistants will be registered as part of their structured degree programme.  In addition the School is committed to providing Teaching Assistants with further development opportunities delivered centrally by UCD Teaching and Learning.	A
3.10	The Review Group recommends that the School strives to ensure that increases in the	1	To some extent the causes of this imbalance (undergraduate student	B

	graduate student population keep pace with the increases in the undergraduate population so that the undergraduate student/TA ratio is held constant. This ratio appears to be drifting upwards to the detriment of the teaching quality.		preferences towards Electronic/Electrical Engineering, and funding to allow for research graduate student recruitment) are outside the School's control. However, the School is committed to monitoring the Undergraduate Student to Teaching Assistant ratio, as well as deploying other strategies (including the increased use of postdoctoral staff) to ensure that teaching quality is not impacted.	
3.11	The Review Group recommends that the School makes every effort to stabilise the technical staff numbers at a level commensurate with the load on the workshops. It also recommends opening up training opportunities for these staff during dips in their workloads.	1/3	To a large extent approval for recruitment of technical staff to address retirement planning concerns is subject to University level approval and headcount targets, which may block any efforts the School may make to stabilise technical staff numbers at a level commensurate with the load on the workshops. The headcount targets are imposed by the Employment Control Framework, and our outside university control.  The approval of training opportunities is within the School's remit and every effort will continue to encourage and facilitate training opportunities for technical staff throughout the academic year. However, it is worth noting that while there are a number of courses provided by Learning and Development, several of which are of general value, the relevance of these courses to the direct training needs of technical staff work is minimal. The Head of School will engage directly with Training and Development to try to ensure more relevant provision in this area, so that technical staff are reassured that the School is committed to do its best to advance their career development.	C  B
3.12	The technical staff promotion freeze is a matter of concern to these staff and appears to be having a negative impact on their morale. The Review Group recommends that the promotion cycle is reintroduced as soon as possible.	2/3	To a large extent the reintroduction of the promotion cycle for technical staff is outside of the School's control and is subject to negotiation between the University and Unions (e.g., on the agreement of a common job description for the role of Chief Technical Officer). Provided these negotiations can be concluded successfully, and new rounds of promotion are introduced by the University, the School is committed to addressing the impact that not having promotion rounds is having on technical staff morale.	C
3.13	The Review Group recommends that the promotion cycle for the administrative staff is reintroduced as soon as possible.	2/3	While a formal promotions cycle has yet to be reintroduced for administrative staff and is to a large extent outside the School's control, the School has had	A

			some success in having permanent administrative posts approved, which have resulted in one staff becoming permanent and another being promoted in the Schools' Office, but no increase in the overall administrative staff headcount. Further work needs to be done at University level to ensure formal promotion rounds are introduced for all administrative staff.	B
3.14	The administrative support of two schools, including this one, is provided by only three people. If one of these staff goes on leave, or is ill, the level of support provided will be significantly reduced. The Review Group recommends that the schools that are sharing this support seek to de-risk this fragility in their administrative cover.	1/2	To a large extent approval for recruitment of additional administrative staff is subject to University level approval and headcount targets (see 3.11), which may block any efforts the School may make to stabilise administrative staff numbers at a levels that will de-risk this fragility in administrative cover in the Schools' Office. Notwithstanding the fact that further budget cuts of 4% are forecast for the coming year (cf. President's Bulletin #14– 8th April 2014), the School is acutely aware that its administrative staff bear one of the highest student to administrative staff ratios among the Science-based disciplines in the University, and will seek to address this issue in the coming year.	B
3.15	There is an oft repeated issue relating to the slow appointment processing of new fixed-term research staff in areas where there is a strong demand for a small pool of skilled people. Long response times have led in some cases to the loss of the best applicants in an already small pool. The Review Group recommends that UCD Human Resources and the associated contracts administration staff work towards a significant reduction in the appointment delays associated with the processing of fixed-term appointments.	2	Unlike other parts of the university, where the supply of qualified potential appointees may often greatly exceed the number of posts available, the School operates under sectoral and market conditions in which talent tends to be in scarce supply and recruitment can be very difficult. The School fully supports this recommendation, while also recognising that even since the visit of the Review Group, HR have introduced better on-line information systems to help track the status of applications.	B

**TEACHING, LEARNING AND ASSESSMENT**

4.8	The Review Group recommends that the School considers implementing a scheme that gives the TAs greater notice of their teaching duties.	1	The School currently makes a great effort to give TAs as much notice of their duties as possible; however, in many years it can be difficult to know, until quite close to the start of term, the precise number of TAs who will be available (this can be due to late/non arrival of postgraduate students, etc.). The system currently adopted is to first circulate a draft allocation of duties, and then make minor amendments just before the semester begins. Certainly, having a clearer knowledge of the spectrum of expertise of each individual postgraduate will make this process more efficient; therefore, the adoption of Recommendation 4.9 (see next recommendation below), which is forthcoming in the next academic year, will help to address this issue.	<b>B</b>
4.9	The Review Group recommends that the School considers implementing a process that will lead to a more even distribution of teaching assignments that are matched to their expertise.	1	A TA survey will be prepared and circulated, whereby each postgraduate student will be asked to list their strengths and weaknesses in different teaching/demonstration areas. This will hopefully result in better matching of TAs with duties, leading to greater satisfaction among the TAs as well as among the students they are supporting. As regards an equalisation of TA workload, prior to TA duty allocations staff will be asked to provide estimates of the number of TA hours required for each of their modules; this will help in determining the required number of TAs to be allocated to each module.	<b>B</b>
4.10	The Review Group recommends that the School considers ways of improving the response rate in student feedback in teaching; this is currently rather low.	1	Students currently receive notifications and email reminders regarding providing their feedback; in general, this is centrally coordinated by UCD T&L. The School recognises that the students might be more likely to be responsive to reminders issued by staff they are familiar with; therefore, starting in the next academic year, it will take the following measures in this respect: (a) placing posters in prominent positions in the Engineering building during the feedback period; and (b) reminding students in person at the beginning/end of the final lectures of some modules. There is also a standing College Staff-Student Committee that provides another valuable forum for feedback.	<b>B</b>
4.11	The Review Group recommends that the	1	In response to this observation, the percentage of grade allocated to continuous	<b>A</b>

	School reviews the use of TAs to grade work (particularly laboratory work) that comprises a high percentage of the module marks. Making module marks too reliant on inexperienced staff is potentially problematic.		assessment has been reduced in some modules; this helps also to combat the issue of excessive workloads on TAs.	
4.12	The Review Group recommends that the School tries to ensure that continuous assessment marking is returned promptly. There was some student feedback suggesting that long delays occur in some cases. As the staff workload associated with CA increases with increasing student numbers, there is likely to be deterioration in CA marking delays unless new processes are introduced.	1	At certain points during the academic year, staff workload levels can rise suddenly and delays can occur in providing feedback to students (e.g., returning of midterm grades). To address this problem, the amount of submitted material for continuous assessment components has been reduced in some modules.	A
4.13	The Review Group recommends that the School remains vigilant to the mixed communication and teaching skills of some of the TA staff. Some undergraduate feedback indicates that there is an issue to address in this area.	1	In terms of teaching ability, the new module “Teaching Assistant in EECE”, which is mandatory for incoming research postgraduate students, provides a training in lab demonstration, effective communication with students, etc. Regarding communication and especially language ability, the School is aware that this is an issue, and is especially evident in our increasing non-EU postgraduate cohort. In this respect, staff do encourage the postgraduate students they supervise to improve their ability in English throughout their degree (regardless of TA duties, this is something they will need for writing papers/theses). However, no proscriptive approach is adopted regarding the improvement of language ability.	A/D
4.14	Student feedback indicates that there are sometimes substantial delays in the laboratories with regards receiving help from TA staff. The Review Group recommends that the School monitors continuously the student TA ratio, which is	1	The School’s monitoring of its student-to-TA ratio is being increasingly monitored, as this issue is now quite critical. We are also currently projecting forward both our anticipated TA and student numbers, and we will be adapting the level of continuous assessment accordingly. We expect we may well be forced to scale back our continuous assessment components over the coming	A

	high and set to increase.		years, perhaps to be rescaled later on as the situation later normalizes.	
4.15	Student feedback indicates that a course in technical writing would be well received. The Review Group recommends that the School considers this possibility.	1	The School does not currently have capacity to develop and deliver a module in technical writing; however, a technical writing module is something we envisage will likely be developed and offered within the University soon, and the School will strongly encourage students to take this when it becomes available.	C
4.16	The Review Group recommends that the technical staff is maintained at present numbers and opposes any further reductions.	1/2/3	Although the School continues to make a case for the stabilisation of technical staff numbers at or above the current level, it is not within the School's power to ensure that this happens, as the University must approve these appointments in accordance with its own targets.	D
4.17	The TAs expressed concerns regarding the lack of a payment structure. The Review Group recommends that the School looks at this issue and comes to some affordable and equitable arrangement.	1/2/3	The financial position of the School currently prohibits payment of the TA cohort for TA duties. When this financial position improves, payment of TAs will be strongly considered as it would likely address a subset of the concerns surrounding TAs such as morale, quality of teaching etc.	C
<b>CURRICULUM DEVELOPMENT AND REVIEW</b>				
5.11	Given the low number of academic staff in the School and possible expansion of programme provision, the School may find it more difficult to provide a quality education to students. The School should be aware of the possibility of spreading its staff too thin. The School should seek to prioritise taught graduate areas for future expansion and target the employment of key staff to lead these programmes. The School should be supported by the College of Engineering & Architecture and University in fulfilling this mission. The Review Group believes that any new taught course provision should	1/2	<p>The School already finds it difficult to provide a quality education to an increasing number of undergraduate and taught graduate students. The recent departure and illness of key staff members, the prospect of some imminent retirements and the difficulties with Teaching Assistants have highlighted this. The School is therefore well aware of the problem of spreading its staff too thinly.</p> <p>Some rationalisation of taught programmes is likely in the coming year.</p> <p>The School would welcome the recruitment of leading international academics, and a consequent increase in PhD student numbers, and agrees that it would be reasonable to expect such appointments to make a significant contribution to the leadership of taught programmes.</p>	B

	match the research portfolio of leading international academics that the School wishes to recruit. An added bonus to the School and University would be that these leading academics could acquire a substantial number of PhD students for the School and University.			
5.12	The School should continue to maintain its excellent relationships with industry partners and seek to establish new ones. This will enhance the learning experience of students who go on placement.	1	The recently appointed internship manager has already expanded and improved links with industry. The visits by academic staff to students on work placement are also improving these relationships.	A/B
5.13	The School should continue to appoint senior adjunct staff, for example, at Associate and full Professorial level, from key industry partners. The School should consider involving relevant adjunct staff in programme review. The School should also consider holding an annual event for adjunct staff where the School can showcase its range of programmes, feedback, and refinements made in the past year etc.	1	Appointment of adjunct staff will continue as the need and opportunity arise. Adjunct staff could be invited to meetings of the programme steering committees where relevant.  The suggestion of an annual event to engage adjunct staff better with the activities of the School is a positive recommendation which will be acted upon.	A/B/D
5.14	The growing numbers of ME programme students in the School indicate that these programmes are popular. The School should continue to aggressively market these programmes nationally and internationally. The School should receive support from the College in achieving this. With international marketing, the School may have to consider the possibility of developing programmes online in their	1/2/3	Marketing of ME programmes continues, with support from the College.  So far, the results of international marketing have not been very encouraging. In order to attract good students, the programmes need to develop an international reputation for quality, which will necessarily take some time.  An online programme offering could be effective in the future, when the reputation is well established. At present, it could easily do more harm than good.	A/C

	entirety or partially. If the School decides to develop online learning it would require the addition of an educational technologist.			
5.15	The ME Biomedical Engineering is an area of growth. To maintain quality in this programme the School should be supported in staff investment in this area, particularly in the area of imaging.	2/3	See comments under section 3.8 earlier. A new appointment has been advertised.	A/B
5.16	The School should be supported in meeting its teaching and research obligations with the BDIC. This collaborative arrangement holds huge potential for UCD in terms of the number of high quality taught and research degree students that could potentially enter UCD after completing their undergraduate degree.	2	See comments under section 3.6 earlier.	B
5.17	The School should move to appoint external examiners for the ME programmes in Biomedical Engineering and Energy systems.	2	It may be noted that there is a lack of clarity in current University instructions to external examiners which suggest that they are appointed to subjects, not to programmes. It would be the responsibility of the Engineering Programme Board to request the appointment of external examiners to the ME programmes mentioned. The School will bring this recommendation to the attention of the EPB.	D
<b>RESEARCH ACTIVITY</b>				
6.12	The School should move quickly to increase the number research active academics.	1	Please see the response to recommendation 2.12 above.	B/C
6.13	The School might reflect on the strategic impact of identifying ways for bridging the gap with the UCD School of Computer	1	This is an important strategic issue for the School, and its identification by the Review Group is acknowledged and appreciated. There are already several	A/B

	Science and Informatics. It might thereby ensure that any such development is mutually acceptable and synergistic. There are opportunities for such cooperation in intelligent energy systems as well as in the internet of things, and optimization of systems.		strong mutually-beneficial engagements between SEECE and SCSl, for example in connection with the ME in Electronic & Computer Engineering and in relation to the BDIC BE in Internet-of-Things Engineering. On the research side, UCD Research is currently leading a process to define an ICT Research Strategy for UCD, which has provided a valuable forum for exploring closer research ties between the two Schools. Active discussions have also been initiated around several possibilities for “Spoke” applications under the SFI Research Centres programme.	
6.14	The School may search for ways to finance and launch a new academic position in biomedical signal processing.	1/2/3	Several discussions have been held with a potential industry funder of such a post, so far without positive outcome. The School accepts the recommendation that it should continue to pursue this dialogue and similar measures.	B
6.15	The School should continue the training of new PhD students in teaching activities. Also there is room for more training in various professional skills, communication and spinoff/innovation activities during the PhD programme and for cooperation on this with other institutions, for example, Trinity College Dublin.	1	In response to the needs identified by this recommendation, the School has created a new module EEEN40530 “Teaching Assistant in EECE” which will be mandatory for all new research postgraduates in the Academic Year 2014/15. The possibility of offering the School’s highly innovative and successful new module EEEN40300 “Entrepreneurship in Engineering” to all PhD students is also under active discussion. Opportunities for closer engagement with TCD will also be kept constantly under review. In addition it should be mentioned that opportunities exist for PhD students to participate in the UCD Innovation Academy and Commercialization Bootcamp.	A
6.16	The School should consider ways to streamline the TA tasks of PhD students. The School is encouraged to develop processes that are lightweight yet effective.	1	This recommendation will be acted upon as far as is practicable, recognising that there is sometimes a mismatch between the demands of TA support and the expertise of the cohort of TAs available for deployment.  See also responses to recommendations 4.8 and 4.9.	B
<b>MANAGEMENT OF QUALITY AND ENHANCEMENT</b>				
7.4	The School should monitor the impact of the leaving certificate Project Maths syllabus on	1	This recommendation has been forwarded to the Mathematical Sciences sub-committee of the Engineering Programme Board. The School will also monitor	A

	the preparedness of students for engineering.		the impact of the Project Maths syllabus within its own modules and report as needed to the EPB.	
7.7	The University should implement a round of internal promotion for technical staff as a matter of urgency.	2/3	Please see the earlier responses to Recommendations 3.12 and 3.13 on this subject.	A
7.8	The School should be supported in replacing retired (and retiring) technical staff.	2/3	The School strongly supports this recommendation, although noting that there are Government-imposed constraints on recruitment through the Employment Control Framework.  See also the response to recommendation 3.11.	A
7.11	To address issues relating to the quality of the learning and research environment, the Review Group recommends the School invite post-graduate and post-doctoral representatives onto its Committee to ensure good lines of communication and a greater sense of involvement in the life of the School.	1	This Recommendation will be brought to the first School Meeting in the 2014/15 Academic Year with a recommendation from the Head of School that it be implemented for future School Council meetings.	A
7.12	The Review Group recommends that 1 <sup>st</sup> year students be exposed (possibly through an elective Engineering module) to formal training in, for example, research skills, technical writing, using the research literature, plagiarism etc.	2	This Engineering Programme Board has agreed to establish a committee to undertake an extensive review of First Year in the Academic Year 2014/15. This recommendation will be communicated to that committee.	A
7.16	The School should be supported by the University in hiring new academic staff in strategically important and high impact research areas to maintain quality.	2/3	The School strongly supports this recommendation.  See also the response to recommendations 3.6, 3.7, 3.8, 3.11 and 3.14.	A

7.17	Staff should be supported in developing consulting practise where appropriate.	1	The School supports this recommendation since it considers that consulting activities within a defined policy framework can be very beneficial to academics in Engineering disciplines. Such activities help to bring direct experience of real-world issues both to the classroom and to the research domain. The School will work with HR to develop more supportive policies for staff in this area.	
7.18	The School should be congratulated with its success in launching spinoff activities, and should be encouraged to continue with these efforts in order to contribute to the establishment of high-tech companies in Ireland.	1	The School is proud of its excellent record of involvement either directly or indirectly in many highly successful start-up companies, and intends to continue its efforts in this direction into the future.	B
<b>SUPPORT SERVICES</b>				
8.5	The Review Group recommends that UCD Human Resources streamline the A-Z of recruitment procedures with a tracking website service for research-funded staff to ensure research-active staff remain highly motivated to carry out their research and that resources are not duplicated.	2	It is proposed that School staff who have direct experience of the difficulties in interacting with HR on the question of recruitment procedures for research staff should meet to formulate how best these procedures be improved and then negotiate with HR to implement the required changes. As remarked in the response to recommendation 3.15 earlier, there have been some recent welcome improvements made to HR processes.	B
8.6	Discipline-specific marketing of School programmes abroad should receive particular consideration, in partnership with the College and the International Office.	1/2	See response under Recommendation 2.10 earlier.	
<b>EXTERNAL RELATIONS</b>				
9.7	The setting up of comprehensive alumni database, perhaps as a dedicated task for an intern, could open up an important	1	Preliminary effort at creating an alumni database has already carried out by a retired member of staff in recent years (Dr. Jim Christie) but the School agrees with the value of this recommendation and will ensure that the database	B

	communications channel not only with past graduates, but also with potential future donors.		receives further and ongoing development over the coming year.	
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### 3. Prioritised Resource Requirements

This section should only contain a list, prioritised by the Quality Improvement Committee, of recommendations outlined in the Review Group Report, which require additional resources. The planned action to address each recommendation with an estimate of the cost involved should also be included:

1. Recommendation 7.16: *The School should be supported by the University in hiring new academic staff in strategically important and high impact research areas to maintain quality.*  
Comments: the School is currently operating at a student:staff ratio in excess of 23:1 and has seen undergraduate numbers choosing Electrical & Electronic Engineering increase dramatically in recent years. Several retirements are imminent. There are serious questions about maintaining academic quality in the immediate future unless there is a significant expansion in academic capacity. Simultaneously, too many research groups are sub-critical in size to achieve any kind of depth or critical mass, while opportunities for expansion in research activity are exceptionally strong. The areas of Biomedical Engineering and Intelligent Energy have been identified by the Review Group, but there are several others. The School wishes to grow from approximately 17 academic staff at present to approximately 32 over the next 4 years. A detailed plan on areas of strategic recruitment is currently being finalised guided by a strategic assessment of national needs and high-impact research opportunity and this will be presented to the College Executive. The additional annual salary cost will be approximately 1M€ per annum after 4 years.
2. Recommendation 7.8: *The School should be supported in replacing retired (and retiring) technical staff.* Recommendation 7.6: *The University should implement a round of internal promotion for technical staff as a matter of urgency.*  
Comments: the loss of key technical expertise through retirement without replacement in 2013, has seriously weakened the support infrastructure for teaching laboratory and research activity within the School. There is also an urgent need for specialised IT technical resource. At the same time, the lack of promotional opportunities for technical staff over an extended period is having a detrimental effect on morale. The additional salary cost of recruiting at least 1 extra technical officer would be approximately 70,000€ per annum.
3. Recommendation 3.14: *The administrative support of two schools, including this one, is provided by only three people. If one of these staff goes on leave, or is ill, the level of support provided will be significantly reduced. The Review Group recommends that the schools that are sharing this support seek to de-risk this fragility in their administrative cover.* Recommendation 3.13: *The Review Group recommends that the promotion cycle for the administrative staff is reintroduced as soon as possible*  
Comments: The administrative load on the current shared School office, covering two very large Schools, is exceptionally high by university standards, and the trajectory is one of an increasing and ultimately unsustainable burden. As identified by the Review Group, the current configuration presents high potential risk through the loss of just one individual. A key step in reducing the risk would be to recruit two additional administrative staff to the School office, perhaps by redeployment from other parts of the university. The additional cost to the School would be approximately 60,000€ annually. Again, as identified in Recommendation 3.13, the lack of promotional opportunities for administrative staff over an extended period is having a negative effect and creates an additional risk around staff retention.