



University College Dublin

REVIEW GROUP REPORT

Periodic Quality Review

UCD School of Electrical & Electronic Engineering

June 2021

Accepted by the UCD Governing Authority at its meeting of 7 October 2021

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Summary Findings of the Review Group

The Review Group has identified a number of key findings in relation to areas of good practice operating within the School and areas which the Review Group would highlight as requiring future improvement. The main section of this Report sets out all observations, commendations and recommendations of the Review Group in more detail. A list of all commendations and recommendations is set out in Appendix 1.

Please note that the numbers below refer to the relevant paragraph in the body of the Report.

Examples of Good Practice

The Review Group identified a number of commendations, in particular:

- 2.9 There is a positive atmosphere and sense of collegiality within the School, particularly amongst the academic staff, including BDIC staff, which has been fostered by the current leadership of the School. The Head of School has demonstrated strong leadership and vision across all areas of School activity throughout his tenure. As staff numbers have increased in recent years, he has developed effective strategies to ensure better integration of BDIC staff.
- 3.10 The Review Group noted a committed faculty and staff with a number of faculty in leadership roles at College level. It also commends the excellent levels of support across the full range of School activities provided by technical staff, administrative staff in the School Office team, and administrative staff attached to funded research projects.
- 4.8 The Review Group commends the School for continually offering a very broad yet high-quality standard of teaching across the whole Electrical & Electronic Engineering spectrum, with strong success/completion rates and a strong link to industrial stakeholders. Students report a high level of satisfaction with taught undergraduate and postgraduate courses, with a high degree of flexibility in terms of specialisation. Despite the large number of programmes and modules offered within the School and in collaboration with other Schools, there is a limited amount of overlap between these. Where there is, this is felt by students to be beneficial in order to consolidate learning and emphasize similar concepts in diverse contexts. Students reported being supported at crucial decision-making times through the degree programme and found that lecturers were very approachable. The increasing number of students who are satisfied with the design and delivery of the programmes testifies both to the quality of the programmes and of the teaching. In particular, interdisciplinary programmes in Engineering are very successful.
- 4.9 The Review Group particularly commended the Professional Work Experience module and the School's success in placing students with local industry. The internships are an important and valuable part of the student experience. Last year a total of 82 students from the School undertook internships with 43 employers. Both students and industrial hosts report high levels of satisfaction with this opportunity, which provides an important strategic industrial link for the School. ElecSoc (the student society) is also active in promoting links with the profession: it has strong links with the Institute of Electrical and Electronic Engineers (IEEE), and the School recently received a congratulatory message from the IEEE for the engagement of the society.

- 6.8 The Review Group commends the School for its success in winning research grants across three main areas of Electrical, Electronic (especially Communications and Integrated Circuits) and Biomedical Engineering, leading to substantial growth in recent years as manifested in the increase in academic staff numbers and research income. The School's strong research profile is demonstrated by large University and national (e.g. SFI) research centres, some significant European grants (Horizon, ERC) and much industrial collaboration, many of which include examples of world-leading research.

Recommendations for Future Improvement

The Review Group would suggest that the following recommendations be prioritised:

- 2.12 Succession planning for the Head of School, whose term of office comes to an end in August 2021, needs to be addressed as a matter of urgency, in line with the University Head of School Appointment Process (statute 6, chapter 17). More generally, short and long-term succession planning, including for Technical Staff and BDIC staff, should be conducted to ensure that retirements and role changes are managed with minimal disruption to School operations. This process should take account of changing disciplinary and support needs within the School.
- 2.13 The current workload model should be reviewed to ensure transparency, accountability and equality of opportunity to pursue different activities. The value of introducing a School sabbatical leave rota should be considered as part of this process. Scope for flexible working patterns and hybrid working arrangements should also be considered, drawing on the experience of COVID-19, both to benefit staff and, potentially, to find creative solutions to the current shortage of office space (see section 3). Any flexible working arrangements must ensure equity and fairness for all staff. The roles and responsibilities of staff in the School Office should be made clearer to other staff across the School. The possible benefits of greater flexibility in roles and knowledge sharing for School Office staff should be considered (e.g. to assist in facilitating annual leave or managing tasks if a staff member is ill).
- 2.14 The Review Group recommends that the School review its requirement for PhD students to act as Teaching Assistants (TAs) across all years of their studies. The remuneration policy for TA duties should also be reviewed and benchmarked against practice elsewhere in the College, the University and in other institutions.
- 3.13 In collaboration with the new College Vice-Principal for Development and other Schools within the College, the Review Group recommends that the School continues to seek ways to expand and update space/facilities through the development of a School Master Plan, which takes into account the need for integrated research collaboration, the facilitation of flexible working arrangements, and the use of shared office spaces, especially in relation to COVID-19 social distancing requirements.
- 3.14 The Review Group recommends that the School develops a plan of action in collaboration with the HR Partner, HR Resourcing Consultant and the College Athena SWAN committee, to improve gender balance among faculty, especially at early career and senior levels, e.g. via the SALI scheme, Ad Astra opportunities, or reactive and strategic recruitment schemes.
- 3.15 Existing School practice around induction/onboarding should be further developed and formalised for all new academic, research, and administrative staff. The formal induction

process should be conducted by the Head of School or designated manager in line with the UCD Probation Periods Policy. Advice on the promotion process for academic staff should form part of annual P4G conversations.

- 7.15 The School should ensure that it adheres to Academic Regulation 4.16 on the internal moderation of all coursework assessments and final examinations in all taught modules.

1. Introduction and Overview of the School

Introduction

- 1.1 This report presents the findings of the Periodic Quality Review of the UCD School of Electrical & Electronic Engineering, University College Dublin, which was undertaken in March 2021.

The Review Framework

- 1.2 Irish Universities have collectively agreed a framework for their quality review and quality improvement systems, which is consistent with both the legislative requirements of the *Qualifications and Quality Assurance (Education and Training) Act 2012*, and international good practice (e.g. *Standards and Guidelines for Quality Assurance in the European Higher Education Area, 2015*). Quality reviews are carried out in academic, administrative and support service units.
- 1.3 The purpose of Periodic Quality Review is to assist the University to assure itself of the quality of each of its constituent units, and to utilise learning from this developmental process in order to effect improvement, including:
- To monitor the quality of the student experience, and of teaching and learning.
 - To monitor research activity, including management of research activity; and assessing the research performance with regard to research productivity, research income, and recruiting and supporting doctoral students.
 - To identify, encourage and disseminate good practice, and to identify challenges and how to address these.
 - To provide an opportunity for units to test the effectiveness of their systems and procedures for monitoring and enhancing quality and standards.
 - To encourage the development and enhancement of these systems, in the context of current and emerging provision.
 - To inform the University's strategic planning process.
 - The output report provides robust evidence for external accreditation bodies.
 - The process provides an external benchmark on practice and curriculum.
 - To provide public information on the University's capacity to assure the quality and standards of its awards. The University's implementation of its quality procedures enables it to demonstrate how it discharges its responsibilities for assuring the quality and standards of its awards, as required by the *Universities Act 1997* and the *Qualifications and Quality Assurance (Education and Training) Act 2012*.

The Review Process

- 1.4 Typically, the review model comprises four major elements:

- Preparation of a Self-Assessment Report (SAR);
- A visit by a Review Group that includes UCD staff and external experts, both national and international. The site visit normally will take place over a two or three day period;
- Preparation of a Review Group Report that is made public;
- Agreement of an action plan for improvement (Quality Improvement Plan) based on the Review Group Report's recommendations. The University will also monitor progress against the Quality Improvement Plan.

Full details of the review process can be found on the UCD Quality Office website: www.ucd.ie/quality.

The Review Group

- 1.5 The composition of the Review Group for the UCD School of Electrical & Electronic Engineering was as follows:
- Professor Joanna Bruck, Head of School, UCD School of Archaeology (Chair)
 - Associate Professor Alexander Thein, UCD School of Classics (Deputy Chair)
 - Professor Russell McKenna, Chair in Energy Transition, School of Engineering, University of Aberdeen (Extern)
 - Professor Anna Maria Bianchi, Professor in Biomedical Engineering, Department of Electronics, Information and Bioengineering, Politecnico di Milano (Extern)
- 1.6 Due to restrictions introduced in response to the COVID-19 virus, the Review Group undertook a virtual site visit of the School in March 2021 and held meetings with the Registrar, Deputy President and Vice-President for Academic Affairs; Head of School; College Principal; SAR Co-ordinating Committee; Academic and Administrative staff in the School; undergraduate and postgraduate students; and other University staff working in support units which interact with the School. The review site visit schedule is included as Appendix 3.
- 1.7 In addition to the Self-Assessment Report, the Review Group considered documentation provided by the School and the University during the site visit.
- 1.8 This Review Group Report has been read and approved by all members of the Review Group.

Preparation of the Self-Assessment Report (SAR)

- 1.9 Following a briefing from the Deputy Director of Quality in March 2020, a Self-Assessment Report Coordinating Committee (SARCC) was established to prepare the Self-Assessment Report (SAR). The SARCC was representative of the key groupings within the School and included a Postgraduate Research student. The SARCC met weekly from September to December 2020, on 14 occasions in total. Members of the SARCC, in consultation with staff members and student representatives, drafted sections of the Self-Assessment Report.
- 1.10 As part of the self-assessment process, the School conducted a survey of all staff and PhD students within the School on their experiences and opinions on a number of topics including communication, organisational structures, workload, support services, professional

development, external collaborations, teaching and research activity, and the impact of the current COVID-19 pandemic on activity within the School. 27 of the 29 full-time academic staff members responded to the survey. Approximately half of the administrative, technical and research staff and 28% percent of PhD students responded. The results of the survey were used to inform the content of the Self-Assessment Report.

- 1.11 The opinions of undergraduate students were gathered through a focus group with class representatives from all of the year groups and programme disciplines. A focus group was deemed by the School to be a more suitable approach than a survey to understand better the issues affecting students and to ensure representation of all groups. All of the class representatives were invited to attend and eight student representatives met with the Head of School, Head of Teaching and Learning and Quality Review Committee Chair for 90 minutes in mid-October 2020. Topics discussed included teaching, assessment, laboratories, student feedback, support services and equality, diversity and inclusion. Student input from the focus group was used to inform the Self-Assessment Report.
- 1.12 Additional information for the School to assist with the development of the Self-Assessment Report was obtained from a number of units within the University, including the UCD Office for Institutional Research.
- 1.13 A draft of the Self-Assessment Report was circulated to all School staff for comment on 3 December 2020. The quality review process was also discussed at all School meetings between September and December 2020. The report was updated in response to comments, and the final Self-Assessment Report was signed off by the SARCC on 17 December 2020 and subsequently sent to the UCD Quality Officer.

The University

- 1.14 University College Dublin (UCD) is a large and diverse university whose origins date back to 1854. The University is situated on a large modern campus about 4 km to the south of the centre of Dublin.
- 1.15 The University Strategic Plan (to 2024) states that the University's mission is: "to contribute to the flourishing of Dublin, Ireland, Europe and the world through the excellence and impact of our research and scholarship, the quality of our graduates and our national and global engagement; providing a supportive community in which every member of the University is enabled to achieve their full potential".
- 1.16 The University is currently organised into six Colleges and 37 Schools:
 - UCD College of Arts and Humanities
 - UCD College of Business
 - UCD College of Engineering and Architecture
 - UCD College of Health and Agricultural Sciences
 - UCD College of Social Sciences and Law
 - UCD College of Science

- 1.17 As one of the largest universities on the island of Ireland, UCD supports a broad, deep and rich academic community in Science, Business, Engineering, Health Sciences, Agriculture, Veterinary Medicine, Arts, Law, Celtic Studies and Human Sciences. There are currently more than 26,000 students in our UCD campus (approximately 16,300 undergraduates, 7,800 postgraduates and 2,200 Occasional and Adult Education students) registered on over 70 University degree programmes, including over 6,300 international students from more than 121 countries. The University also has over 5,400 students studying UCD degree programmes on campuses overseas.

UCD School of Electrical & Electronic Engineering

- 1.18 The School of Electrical and Electronic Engineering is one of seven schools within the College of Engineering and Architecture in UCD. The College is made up of the Schools of Architecture, Planning and Environmental Policy; Biosystems and Food Engineering; Chemical and Bioprocess Engineering; Civil Engineering; Electrical and Electronic Engineering; and Mechanical and Materials Engineering. The discipline of computer science, often linked with electronic engineering in universities worldwide, resides within the School of Computer Science in the College of Science. Since 1989 the School has been located in the Engineering and Materials Science Centre on UCD's Belfield campus.
- 1.19 The three subject areas within the School are Electrical Engineering, encompassing the generation, control and use of electrical energy, Electronic Engineering, dealing with the production, transmission and processing of information in the form of electrical signals, and Biomedical Engineering, which applies engineering to address problems in healthcare and medicine. There is considerable overlap between subjects and the School operates as a unified whole, with separate committees to deal with subject-specific matters. Biomedical Engineering was introduced as a new subject in 2015, with research and taught programmes supported jointly with the School of Mechanical and Materials Engineering.
- 1.20 The previous Periodic Quality Review of the School was undertaken in November 2013, when it was known as the UCD School of Electrical, Electronic & Communications Engineering.
- 1.21 The School has a leading role in the delivery of two degree programmes in China through the Beijing-Dublin International College (BDIC), a joint international partnership between UCD and Beijing University of Technology (BJUT) located on the BJUT campus in Beijing.
- 1.22 There are 32 academic staff associated with the School - thirteen are primarily associated with Electronic Engineering, eight with Electrical Engineering, four with Biomedical Engineering and seven with BDIC. Of these 32, one person has moved to Imperial College London but remains at 0.1 FTE in UCD, one person is currently at 0.2 FTE as they are in the role of Chief Technical Officer of a spin out company, and a third person is on extended sabbatical with a laboratory overseas. There were thus 29 full-time academic staff within the School at the time of the review.
- 1.23 The number of research staff based in the School changes frequently - currently there are 44 researchers and eight research support staff among the research funded staff.
- 1.24 There are four administrative staff in the School, who cover the administration for both this School and the School of Mechanical and Materials Engineering, and there are five technical

staff in the School who run a workshop which caters to the needs of the School as well as several other Schools within UCD.

- 1.25 The profile of the academic staff reflects good diversity in terms of internationalization, with fourteen academic staff (44%) from outside Ireland and a high proportion of the Irish staff having experience at other institutions internationally. The number of female academic staff remains low, at two (6% of the total) academic staff members.
- 1.26 In the period since the last quality review in 2013, the School has made a number of academic hires facilitated through the growth of programmes in Biomedical Engineering and in BDIC. However, the scale of the School remains small by international standards.
- 1.27 On the last University census date of 13 February 2020, the School had 29 academic full-time equivalents (FTEs) and 414 student FTEs, giving a student-faculty ratio of 14.3:1. This ratio is close to the average for the engineering schools in UCD, although lower than the ratio for the University as a whole (which is approximately 19.7:1). It should be noted, however, that analysis of the data reveals a more complex situation as around 500 students (200 FTEs) registered in BDIC are not included in calculation of the UCD student-faculty ratio.
- 1.28 Demand for places in UCD Engineering is high, with the highest ever number of students (332) admitted in 2020 and UCD maintaining its position as the leading choice for engineering applicants nationally. Student interest in Electronic and Electrical Engineering remains strong with 72 (25% of first year) students choosing Electrical and Electronic in 2020 (range for 2017-2020: 21-25%). Student numbers in Biomedical Engineering have grown since the introduction of the programme in 2015 to approximately 40 students per year, representing 13% of first year students in 2020 (range for 2017-2020: 11-18%). In 2020-21, 77% of Stage 3 students chose to progress to a taught Masters programme. This has remained relatively stable over the past four years (range for 2017-2020: 69-78%). Approximately 500 students, equivalent to 200 FTEs are enrolled on programmes supported by the School in BDIC.
- 1.29 There is a significant cohort of PhD students in the School, with an average of 96 PhD students over the period 2018-2020, and a small number (3-5) of Research Masters students. On average, 3.5 PhD students are supervised per academic FTE, more than double the College average of 1.57 per academic FTE.
- 1.30 The School is ranked 151-200 in the subject of Electrical & Electronic Engineering in the 2020 QS World University rankings. The subject area of Biomedical Engineering is not included in the QS World University ranking system.
- 1.31 The Periodic Quality Review of the School took place in the midst of the COVID-19 pandemic. Through the staff survey conducted as part of the development of the Self-Assessment Report, all staff reported on the impact of the challenges posed by COVID-19 on their research, teaching and health. Continuity of teaching and assessment and supervision of PhD students has been maintained with the majority of staff reporting good or very good continuity across these areas. Eighty-five percent of staff reported having the resources to continue to work effectively. As the School moves out of management of the current situation towards longer term planning, a risk assessment and management plan has been developed for the School and is being

implemented. The plan identifies areas of high risk and the path towards mitigating these, and was included as an appendix to the Self-Assessment Report.

2. Organisation and Management

General Comments and Context

- 2.1 The School has engaged constructively with this Periodic Quality Review and most of the stakeholders associated with the School have contributed directly to the preparation of the SAR. The Review Group was pleased to have the opportunity to meet and have productive dialogue with so many of these people using a wholly online process.
- 2.2 School roles (e.g. Graduate; Equality Diversity and Inclusion (EDI); Internationalisation; Research; etc.) directly map to those at College level, ensuring effective lines of communication between School and College committees. Role descriptions are not available in every case for these positions, although University guidelines inform practice at a day-to-day level. The School Executive Committee (SEC) comprises the Head of School (Chair), Heads of Subject, Head of Teaching & Learning, Head of Research & Innovation, a Programme Director, a representative of Technical staff, and a representative of Administrative staff. The SEC meets every three weeks providing effective support to the Head of School and facilitating swift response to emerging challenges. Although SECs elsewhere in the University often include all office holders (e.g. EDI, Internationalisation, Graduate, etc.), the School's smaller SEC would be typical of many Schools. Office holders who are not members of the SEC are well-briefed, understand their roles clearly, and are supported to carry these out effectively.
- 2.3 In addition to the Head of School, other leadership and management roles within the School include the School Operations Manager; Head of Graduate Studies; Head of Internationalisation; Head of Teaching & Learning; Head of Research & Innovation; Head of Equality, Diversity & Inclusion; Programme Directors (including for BDIC); and Chief Technical Officer. School committees support the work of these role holders across all areas of School activity. Most roles are held for 3-6 years, providing staff with opportunities for professional development and for knowledge to be spread among multiple members of the School community. The Head of School will be coming to the end of his tenure in August 2021.
- 2.4 The School Council comprises all members of academic staff, and representatives of the technical and administrative staff, and meets approximately monthly during the academic year to facilitate a high level of communication and consensus-building in relation to key decisions. Reports from School office holders are tabled at School Council meetings. Although most staff demonstrate a good awareness of School activities, processes and priorities, it was found that there is some variability, with staff sometimes less informed regarding University-level processes, supports and opportunities.
- 2.5 The Head of School is an *ex officio* member of the College Executive and a member of the BDIC Heads of School Forum. Other School office holders (e.g. the Head of Teaching and Learning, Head of Research and Innovation, etc.) represent the School on the relevant College-level committees.
- 2.6 The School Office staff support both the School of Electrical & Electronic Engineering and the School of Mechanical & Materials Engineering. Members of staff in the School Office have specific responsibilities (e.g. HR and financial management; module, programme and curriculum support; etc.) and this ensures that a high level of specialist knowledge and support

can be delivered to staff and students. Research managers and administrators report directly to Principal Investigators (PIs).

- 2.7 The School workload model lists the modules coordinated by each member of academic staff, the number of projects supervised, number of research students supervised, and School, College and University roles, including School committees. Specific weightings or credits are not provided for these different activities, with the workload model being primarily descriptive. Research activities (other than supervising PhD students) are not included in the workload model, nor is allowance made in the current workload model for academic staff to apply for sabbatical leave.
- 2.8 The Review Group heard evidence that PhD students are currently required to act as Teaching Assistants throughout all four years of their PhDs, in a wide variety of modules, irrespective of research area and career ambitions. They are not remunerated for this work in their first year of the PhD programme.

Commendations

- 2.9 There is a positive atmosphere and sense of collegiality within the School, particularly amongst the academic staff, including BDIC staff, which has been fostered by the current leadership of the School. The Head of School has demonstrated strong leadership and vision across all areas of School activity throughout his tenure. As staff numbers have increased in recent years, he has developed effective strategies to ensure better integration of BDIC staff.
- 2.10 School role holders are highly knowledgeable and engaged around their particular roles. Three members of the School staff hold College and University roles (UCD Vice-President for Research, Innovation and Impact; College Vice-Principal for Research, Innovation & Impact; College Vice-Principal for EDI) reflecting the School's strong engagement with and commitment to the University's values.
- 2.11 Strong student recruitment, success in securing research grants, and initiatives such as the establishment of the BDIC programmes have ensured that the School is in a sound financial position.

Recommendations

- 2.12 Succession planning for the Head of School, whose term of office comes to an end in August 2021, needs to be addressed as a matter of urgency, in line with the University Head of School Appointment Process (statute 6, chapter 17). More generally, short and long-term succession planning, including for Technical Staff and BDIC staff, should be conducted to ensure that retirements and role changes are managed with minimal disruption to School operations. This process should take account of changing disciplinary and support needs within the School.
- 2.13 The current workload model should be reviewed to ensure transparency, accountability and equality of opportunity to pursue different activities. The value of introducing a School sabbatical leave rota should be considered as part of this process. Scope for flexible working patterns and hybrid working arrangements should also be considered, drawing on the

experience of COVID-19, both to benefit staff and, potentially, to find creative solutions to the current shortage of office space (see section 3). Any flexible working arrangements must ensure equity and fairness for all staff. The roles and responsibilities of staff in the School Office should be made clearer to other staff across the School. The possible benefits of greater flexibility in roles and knowledge sharing for School Office staff should be considered (e.g. to assist in facilitating annual leave or managing tasks if a staff member is ill).

- 2.14 The Review Group recommends that the School review its requirement for PhD students to act as Teaching Assistants (TAs) across all years of their studies. The remuneration policy for TA duties should also be reviewed and benchmarked against practice elsewhere in the College, the University and in other institutions.

- 2.15 Ways of enhancing the sense of community and collective identity among post-doctoral researchers, research administrators and postgraduate research students should be explored by building academic and social links between labs and research groups, for example via School research symposia.

3. Staff and Facilities

General Comments and Context

- 3.1 The School has experienced a major expansion since the last Quality Review in 2013: from 17 academic staff, 6 technical staff, 15 research staff, and a half share of 3 administrative staff, to the current headcount of 32 academic staff, including 3 on secondment, 5 technical staff, 52 research staff, including 8 research managers and administrators, and a half-share of 5 staff in a School Office shared with the School of Mechanical & Materials Engineering. Of the new academic staff, 7 are attached to BDIC.
- 3.2 In spite of the recent expansion of the academic staff, with 15 new hires since the last Quality Review, there are only 2 female faculty from a total 32. This figure of 6% is significantly below the College average of 20%. Among School research staff there are 8 female researchers from a total 44, i.e. 18%, and there are no female technical staff. Among the administrative staff the gender imbalance is reversed: 7 out of 8 research managers or administrators are female, and all four administrators in the shared School Office are female, reporting to a male Operations Manager.
- 3.3 The Review Group acknowledges that there are challenges in recruiting high-calibre staff to advertised positions: the cost of living in Dublin is high, and postdoctoral research positions cannot compete with industry. PhD students employed by the School as TAs are most affected by high rents and living expenses.
- 3.4 New staff are well supported by the School Office or ad hoc by colleagues in the School, but it was found that there is no formal on-boarding and induction process carried out during the probationary period in line with the UCD Employee Orientation Policy and Probation Periods Policy. This states that all new members of staff, both faculty and administrative, should have four formal meetings with the Head of School or a designated manager during their first year, in the 3rd, 6th, 9th and 11th months of their contracts, with the key points from each meeting recorded on a template form, and a confirmation form submitted by the Head of School to UCD Human Resources at the conclusion of the probationary period.
- 3.5 Among academic staff the Review Group noted a limited awareness of the promotion process, along with an assumption that teaching is not valued in the UCD Career Development Framework.
- 3.6 UCD has a policy on Research Sabbatical Leave for Faculty that allows for six months' research leave every seven trimesters, or one year in seven. In the survey carried out as part of the Periodic Quality Review process, 68% of staff expressed an interest in applying for sabbatical leave in the future, while 63% were unaware that it was an option. During the site visit the Review Group noted a strong interest in sabbatical leave, shared by senior faculty, along with a perception within the discipline that sabbatical leave is for a period of research external to UCD/Ireland. The introduction of a sabbatical leave rota can be expected to require changes to the School teaching allocation and workload model.
- 3.7 The academic, research, and administrative staffing has doubled since the last Periodic Quality Review in 2013, and there has also been a significant increase in the number of PhD students,

but the space occupied by the School in the Engineering Building has not changed. Laboratory space is particularly limited, a number of BDIC staff share offices, research groups are spread across different buildings, and even in the School Office, which is shared by five staff, concentration and privacy are concerns.

- 3.8 The Review Group understands that space will be made available to the School as part of the Future Campus Project in the Teaching and Learning Building and Centre for Creativity, but it acknowledges that in the immediate short-term space is a serious challenge, and that there is also a need for the School to secure additional funding, for example philanthropic funding, to refurbish its existing space in the Engineering and Materials Science Centre building, which is 32 years old.
- 3.9 A further challenge is how best to use the existing space, and plan for the future, to create an environment which fosters collegiality between all members of the School, from academic, technical and administrative staff to researchers and PhD students.

Commendations

- 3.10 The Review Group noted a committed faculty and staff with a number of faculty in leadership roles at College level. It also commends the excellent levels of support across the full range of School activities provided by technical staff, administrative staff in the School Office team, and administrative staff attached to funded research projects.
- 3.11 A large number of faculty have been recruited to the School since the last Quality Review, in part with external funding, and this has facilitated the development of new programmes and disciplines.
- 3.12 New administrative staff have been recruited to the School Office shared with the School of Mechanical & Materials Engineering, and the School Plan has the budget in place to recruit technical staff to replace future retirements.

Recommendations

- 3.13 In collaboration with the new College Vice-Principal for Development and other Schools within the College, the Review Group recommends that the School continues to seek ways to expand and update space/facilities through the development of a School Master Plan, which takes into account the need for integrated research collaboration, the facilitation of flexible working arrangements, and the use of shared office spaces, especially in relation to COVID-19 social distancing requirements.
- 3.14 The Review Group recommends that the School develops a plan of action in collaboration with the HR Partner, HR Resourcing Consultant and the College Athena SWAN committee, to improve gender balance among faculty, especially at early career and senior levels, e.g. via the SALI scheme, Ad Astra opportunities, or reactive and strategic recruitment schemes.
- 3.15 Existing School practice around induction/onboarding should be further developed and formalised for all new academic, research, and administrative staff. The formal induction process should be conducted by the Head of School or designated manager in line with the

UCD Probation Periods Policy. Advice on the promotion process for academic staff should form part of annual P4G conversations.

- 3.16 Provision should be made in the teaching and administrative workload allocation for faculty to apply for sabbatical leave.
- 3.17 Recruitment of staff should follow College and University policy, procedures and practice. All posts, including externally-funded research staff, should be advertised to ensure transparency and adherence to best practice on recruitment and reporting.
- 3.18 Academic staff must comply with the University's policy on consultancy and submission of annual returns.

4. Teaching, Learning and Assessment

General Comments and Context

- 4.1 The School contributes to a diverse set of programmes and pathways within Electrical & Electronic, Electronic & Computer, Electrical Power, Biomedical and Optical Engineering. This teaching portfolio is centred around the three key areas of Electrical, Electronic and Biomedical Engineering (the latter was introduced in 2015). Progression and retention is monitored at the College rather than School level. Overall these data are positive, with progression at 91% and retention at about 96% from 2014-2018. In addition, about 80% of students complete their degrees in the expected time.
- 4.2 The total student intake into First Engineering is around 300 students, with about 20% in the Widening Participation student cohort and a gender ratio of about 70:30 male:female. The proportion of female students in the first year of Engineering courses has increased from about 19% in 2013 to 34% in 2019, with higher proportions of students in Biomedical Engineering (51%) compared to Electrical & Electronic Engineering (24%).
- 4.3 In the undergraduate programmes, the ratio of EU:non-EU students is approximately 10:1. This seems to have been only marginally affected by Brexit, as only 3 student FTEs were from the UK in 2020. The taught postgraduate programmes involve most of the international students alongside the predominantly Irish graduates of the School's undergraduate programmes.
- 4.4 The School also has a strong involvement in the Beijing-Dublin International College (BDIC), where it offers two of a total of four Bachelor of Engineering (BE) programmes, in Internet of Things Engineering and Electronic and Electrical Engineering respectively. These two programmes involve approximately 200 FTE (around 500 predominantly Chinese students) at BDIC (see also section 9).
- 4.5 The total number of modules offered, including taught, project and work experience (as applicable), is about 70 in UCD and 22 at BDIC, resulting in about 3.2 per staff member. The total number of taught students FTEs is about 500, excluding research postgraduates. The overall student:staff ratio is about 22, with substantial differences between those for UCD staff (about 19) and BDIC staff (29) - though there is some overlap, so these numbers are inexact. Class sizes vary between modules and stages, from 330 at Stage 1 to as few as three in Stage 5, with the majority of classes having 20-100 students.
- 4.6 At the time of the current Periodic Quality Review the majority of teaching is taking place online, with recorded lectures and additional material uploaded to a virtual learning platform. All courses in the School rely on laboratory sessions to give students 'hands on' experience of using equipment and thereby facilitate practical application of theory. Tutorials are supervised problem-solving sessions intended to incentivize and facilitate application of learnt methods and skills. In addition, assessed research projects form an integral part of all of the School's programmes, in some cases with/in industry, involving a sustained period of critical problem-solving, applied research and time/project/self-management.
- 4.7 In the case of the ME programmes a Professional Work Experience module is mandatory. This involves a structured and formally assessed placement with a company, which is assessed on a pass/fail basis.

Commendations

- 4.8 The Review Group commends the School for continually offering a very broad yet high-quality standard of teaching across the whole Electrical & Electronic Engineering spectrum, with strong success/completion rates and a strong link to industrial stakeholders. Students report a high level of satisfaction with taught undergraduate and postgraduate courses, with a high degree of flexibility in terms of specialisation. Despite the large number of programmes and modules offered within the School and in collaboration with other Schools, there is a limited amount of overlap between these. Where there is, this is felt by students to be beneficial in order to consolidate learning and emphasize similar concepts in diverse contexts. Students reported being supported at crucial decision-making times through the degree programme and found that lecturers were very approachable. The increasing number of students who are satisfied with the design and delivery of the programmes testifies both to the quality of the programmes and of the teaching. In particular, interdisciplinary programmes in Engineering are very successful.
- 4.9 The Review Group particularly commended the Professional Work Experience module and the School's success in placing students with local industry. The internships are an important and valuable part of the student experience. Last year a total of 82 students from the School undertook internships with 43 employers. Both students and industrial hosts report high levels of satisfaction with this opportunity, which provides an important strategic industrial link for the School. ElecSoc (the student society) is also active in promoting links with the profession: it has strong links with the Institute of Electrical and Electronic Engineers (IEEE), and the School recently received a congratulatory message from the IEEE for the engagement of the society.
- 4.10 The impact of COVID-19 on teaching and learning has been challenging for the School, with systemic University-level problems affecting the School and students (e.g. the shift to continuous assessment; and the removal of the study week prior to autumn exams). In response, the School is looking at options relating to remote assessment. On the technology front, staff in the School took advantage of funding available from the University for additional equipment to support delivery of online teaching and assessment. Whilst examination integrity is still a significant challenge, assessment processes are generally judged as satisfactory by the students, despite the trend towards more Continuous Assessment (CA), requiring careful management of deadlines across modules to avoid 'spikes' in submission dates towards the end of the semester.

Recommendations

- 4.11 The Review Group recommends that the School continue to explore ways of increasing awareness and participation in international study opportunities. This includes but is not limited to the ERASMUS+ and ERASMUS programmes. If language and programme content matching is a key challenge, then priority should be on those regions / countries where this is not an issue. Opportunities need to be flagged up to students early on, whilst bearing in mind the desire to spend some time abroad and considering the GPA neutral approach to exchanges. In this context, exploiting the resources of the Rowan database and UCD Global's linkages is strongly recommended.

- 4.12 The Review Group recommends that the School considers how to retain the best aspects of the new forms of teaching, learning and assessment developed during COVID-19. It should also take further measures to close the loop between student feedback and module coordinators. Research-led teaching could be further developed, with more guest lectures to illustrate industry relevance.
- 4.13 The School, in collaboration with the College widening participation committee, should expand their outreach activities and consider other strategies to increase the percentage of under-represented students to closer to the University target. There may be opportunities here to create a secondary schools liaison role and enhance online/remote teaching in close collaboration with the College Educational Technologist.

5. Curriculum Development and Review

General Comments and Context

- 5.1 The School has developed a wide range of degree programmes (57 programmes and majors) taking advantage of the modular system providing a large number of specialisations in the area of Electronic and Electrical Engineering. More recently the ME Biomedical Engineering (2009) and BE Biomedical Engineering (2015) degrees were also introduced.
- 5.2 Programmes are designed following the modular system which allows flexibility in the creation of different curricula and takes advantage of modules shared with other programmes (e.g. Mathematics and Statistics modules).
- 5.3 While programmes in Electrical and Electronic Engineering are well developed and established, Biomedical Engineering is still evolving. Expertise is mainly in signal processing and rehabilitation with a specific focus on neurosciences. A gap in biomedical imaging was already identified, and the School developed a new module – EEEN30210 Biomedical Imaging – in 2017-18 to address this (the module was subsequently re-coded as EEEN40620 Biomedical Imaging from 2018-19 onwards).
- 5.4 It was noted that there is significant potential for expansion and development in the area of Energy Systems Engineering, including in coordination with the Energy Institute. This has potential for increasing undergraduate programme curriculum development and student enrolments.
- 5.5 The development and review process for the programmes is highly structured, through the Engineering Programme Board and specific Programme Steering Committees (PSC). All programmes are now stabilised and adjustments are discussed on a yearly-basis by the PSC.
- 5.6 The School has promoted debate and discussion with other schools by including members from other schools in the PSCs of the different degree programmes. Specific modules are delivered by other schools when needed and the use of existing modules or creation of new ones is negotiated with other schools.
- 5.7 Accreditation by the professional body Engineers Ireland takes place every five years, with annual accreditation for BDIC by the Ministry in China. This ensures alignment between the programmes offered by the School and the wider profession, with the School demonstrating a high level of awareness of and responsiveness to the needs of industry.
- 5.8 Programme review is mainly carried out on a single programme basis. Challenges may arise when new modules are required with the need for new competences which may necessitate hiring new teaching staff or the involvement of other Schools.

Commendations

- 5.9 The Review Group commends the School for promoting collaboration/coordination with other Schools when the programmes require input from areas which exist outside the School, especially in relation to interdisciplinary programmes.

- 5.10 The Review Group commends the School for the quality of the curriculum and teaching provided which is recognised by industries. Internships are fully integrated into the programmes and are highly appreciated by the profession. Internship positions are made available for students through the traineeship office. The accreditation process ensures that the needs of the relevant professions are fully met. The technical skills and the strong focus on fundamentals of Engineering make UCD students/graduates very prepared for work and very flexible, able to face any kind of technical problems and to be active in designing new solutions.
- 5.11 The Review Group commends the procedure for quality assessment for the teaching modules which is implemented through the presence of External Examiners, one for Biomedical Engineering and one for Electrical and Electronic Engineering. External Examiners play an important role in benchmarking with their own universities and other universities where they have served as External Examiners.

Recommendations

- 5.12 The Review Group recommends that the already excellent profile of School graduates be further enhanced to make them more attractive and better equipped for industrial employers. In particular the Python programming language does not yet seem to be extensively taught in the School, while it is largely used in industry and should be introduced as early as possible in the undergraduate curriculum; analogue Printed Circuit Board design is recommended rather than lower-level circuit theory/software; the regulatory landscape should be considered, which is especially relevant for modules/programmes relating to biomedical engineering and energy. Another area of improvement is in presentation and public speaking skills, which could be integrated into the undergraduate curriculum. This is particularly relevant when students/graduates enter multidisciplinary environments in industry. Also, ethics should be better addressed according to the recommendations of Engineers Ireland during the accreditation process. In general, transferable skills (such as presentation, public speaking, ethics, etc.) deserve higher consideration within programme outcomes and included in the curriculum.
- 5.13 The School should continue to maintain its excellent relationships with industry partners and seek to establish new ones, including also other collaborations, for example with hospitals or clinics, which might contribute to Biomedical Engineering, both in the design of the curriculum and for internships. The Review Group supports the School's proposal to establish an Industrial Advisory Board, identified as a core objective in the School Plan 2020-2024, in order to have formal relationships for curriculum development and revision (see also 10.9).
- 5.14 The Review Group recommends that the School builds on the findings of the Inclusive Teaching Pilot Study, carried out as part of the College Athena SWAN plan, in order to embed inclusive design and promote widening participation. The School should also further develop links with UCD Access and Lifelong Learning.
- 5.15 The Review Group recommends that the School considers the introduction of a reading week for undergraduate students in the first trimester.

6. Research Activity

General Comments and Context

- 6.1 The Review Group observed that the School has a broad research profile across three main areas of Electrical, Electronic (especially Communications and Integrated Circuits) and Biomedical Engineering, with some world-leading examples of research within this portfolio. Some very strong individuals and research groups with international reputations are especially (but not only) in the grid-integration of renewables and multi-energy systems. Many of these activities are linked to the UCD Energy Institute, which is home to >€25 million funded research programmes. There is a strong coherence across the evolving school research themes (Energy System Integration, Communication and Internet of Things, Health) which underpin a number of the national research priorities. The School intends to assume a leadership role in these areas. The research group in Biomedical Engineering is growing in reputation and visibility at the international level.
- 6.2 Income from research is reasonably steady at €5-11 million per year, with fluctuations due to the start-up and completion of (especially larger) projects. The majority of this funding comes from national sources, with over 50% from the Science Foundation Ireland, which together with other Irish sources accounts for up to 85% of income. There are more modest contributions (up to a maximum of €1 million annually each) from International and Irish Business, European sources and from UCD own funds. Particularly noteworthy is the contribution of ERC funding for a project on Proof-of-Concept on Parkinson's Disease.
- 6.3 The School is one of the leading partners in the SFI Research Centre for Future Networks and Communications (CONNECT) and plays a key role in the SFI Research Centre for Data Analytics (INSIGHT), where many industry-sponsored projects were formed. In energy systems, the School is running a large strategic partnership programme (worth over €11m) with major energy companies in Ireland (ESIPP). The national research funding landscape prioritises interdisciplinary research on specific themes and leaves little space for blue sky/individual research. This is particularly challenging for Early Career Researchers who have not yet established strong networks of collaborators.
- 6.4 The recent growth of the School has involved the addition of several new and strategically important academic roles around specific research areas, but also the loss of some high-profile academics to other institutions.
- 6.5 The School has a total of about 100 Research Postgraduates mainly pursuing a PhD by research (up from approximately 60 during the previous review in 2013), with a small number of Research Masters, though this figure fluctuates year-on-year. The PhD programme typically takes four years and is generally assessed via a monograph, though a thesis by publication is also possible.
- 6.6 There is a strong industrial component to much of the research activity, especially in Electronic Engineering (e.g. microelectronics), including collaborative projects and internships. This results in good knowledge transfer activity, many patents and collaborations with local industries and companies, all of which fosters commercialisation. Indeed many spin-offs and

start-ups have been established in recent years by undergraduate and postgraduate alumni from the School, some with the School's ongoing involvement.

- 6.7 There is a very strong research output in terms of absolute numbers of peer-reviewed publications. Expressed per FTE staff member, the average peer-reviewed research output is about 14 per year, compared to about 7.5 for the College. Impact Factors of these research outputs are also very high when compared to global, national and College averages. Downloads of publications have increased from about 20,000 to over 45,000 from 2018 to 2020, with most downloads from the US, China, India, UK, France and Germany.

Commendations

- 6.8 The Review Group commends the School for its success in winning research grants across three main areas of Electrical, Electronic (especially Communications and Integrated Circuits) and Biomedical Engineering, leading to substantial growth in recent years as manifested in the increase in academic staff numbers and research income. The School's strong research profile is demonstrated by large University and national (e.g. SFI) research centres, some significant European grants (Horizon, ERC) and much industrial collaboration, many of which include examples of world-leading research.
- 6.9 There is an excellent alignment between School research areas and the University's strategic themes (Creating a Sustainable Global Society; Transforming through Digital Technology; Building a Healthy World; and Empowering Humanity).
- 6.10 The School has a very strong publication output per member of academic staff, around double that of the College overall and competitive with, if not higher than, equivalent departments internationally. Almost all academic staff are actively engaging with national and international organisations beyond UCD, including as reviewers for journals, conferences and research proposals, and on committees and/or working groups of IEEE panels. Many of these activities result in awards and recognitions, which emphasize the impact achieved.

Recommendations

- 6.11 The School is encouraged to support staff in identifying suitable calls, and in grant-writing, as well as to improve the internal pre-submission peer-review process. There is good general support for grant writing across UCD but this could be more targeted within the School. An example from Computer Science is of a role dedicated to this in specific subject areas, funded by research funds within that School. An additional internal round of peer-review on grant applications should improve the success rates achieved.
- 6.12 The Review Group recommends that the School further promotes the building of European partnerships in order to encourage participation in EU research programmes. Staff members report that participation in EU funded research projects is challenging because their teaching, research and administration duties make it difficult to ringfence the significant amount of time required to prepare a grant application. Further, involvement in EU projects as Principal Investigator (PI) requires a considerable amount of administration and management, which can

discourage potential applicants. The Review Group suggests creation of support organs helping in these activities, which should be assisted by centralized UCD support infrastructure.

- 6.13 The Review Group recommends that the School maintains its strong links with industrial stakeholders, both in research projects and for input to teaching. Industrial stakeholders and alumni might benefit from being more integrated with the School through occasional events. The potential for industrial co-funded PhD and postdoctoral positions should be explored.

7. Management of Quality and Enhancement

General Comments and Context

- 7.1 The School engages with a range of quality enhancement mechanisms, including curriculum review, programme and module design and approval, student feedback, external examining, and a regular cycle of external accreditation.
- 7.2 The School also engages with the Periodic Quality Review process, and as part of its last review, as the School of Electrical, Electronic & Communications Engineering in 2013, it prepared a Quality Improvement Plan to address the recommendations of the last Review Group.
- 7.3 In 2015, UCD established the Equality, Diversity and Inclusion Group (EDI), and since then the UCD College of Engineering and Architecture has received an Athena SWAN Bronze award in recognition of its commitment to improving gender equality across its six schools. This award is shared by the School of Electrical & Electronic Engineering, and the issue of gender imbalance in the School, in particular among the permanent academic staff, featured on several occasions during the Review.
- 7.4 Since 2016 the research performance of all academic staff in the University is measured by the University's Output Based Research Support Scheme (OBRSS), and the data from the 2020 report records that the School of Electrical & Electronic Engineering is 100% research active, with individual grants in excess of both the College and University average. The Review Group report from the Periodic Quality Review in 2013 (section 2.12) recommended that the School work to increase the number of research active staff.
- 7.5 Student performance and grade distributions on taught modules are evaluated on a trimester basis by the School Modular Examination Committee, the Engineering Programme Board, and the Subject External Examiners. There is moderation in the form of double-marking for BE and ME projects, but the Review Group found that for other taught modules there was no system of internal moderation, as required by Academic Regulation 4.16. Moderation need not take the form of double-marking for large modules. It can be based instead on a sampling of scripts.
- 7.6 Student feedback on modules attests to the high standard and commitment of teaching staff, but response rates for the School have declined from 29% in 2011/12 to 19% in 2018/19. One factor noted in the Self-Assessment Report is student unease that feedback given during the trimester might have a negative impact on the marking of assessments. This is a misconception, and students need to be informed that module coordinators have no access to student feedback until the Grade Approval Process is complete. At present the only mechanism for anonymous feedback during the teaching trimester is the programme-level Engineering Staff-Student Liaison Committee. There is no School equivalent.
- 7.7 In 2019, UCD introduced Performance for Growth (P4G) as a framework for all staff to reflect on the achievements and challenges of their roles, and their career development needs, in the context of an annual review conversation with their line manager. This has been implemented by the School, with a positive engagement from staff.

- 7.8 UCD offers a portfolio of training opportunities for non-academic staff, but these are often very general and do not satisfy the discipline-specific requirements of the technical staff. This is an issue that was highlighted in the Periodic Quality Review for 2013 (Review Group Report, section 7.5).

Commendations

- 7.9 Staff and students have engaged positively with the Periodic Quality Review process, and the School engages in a separate process of programme and subject review for successful accreditation by Engineers Ireland. External examining processes are robust, with positive feedback, and the School also receives high scores across all taught modules in the University-wide end-of-trimester Student Feedback process. Industry stakeholders attested to the Review Group that students are well qualified for internships and the workplace.
- 7.10 Staff engage with professional development opportunities, and in each of the years 2017/18 and 2018/19 two members of faculty were recipients of a University Teaching and Learning Award. Steps have been taken since the last Quality Review to improve the teaching quality of Teaching Assistants (TAs) with the introduction of a compulsory training module (EEEN40530 Teaching Assistant in EECE) and a TA Performance Oversight Committee.
- 7.11 The University Regulations on the Structured PhD are fully embedded, with a School Graduate Research Governing Board, and up-to date records on individual student progress maintained by the School Office to ensure that each student is supported by a Research Studies Panel and carries out the Transfer Assessment to progress from Stage 1 to Stage 2 of the PhD within the allotted time frame.
- 7.12 The Review Group found that the shift to online teaching during the COVID-19 pandemic has worked well, despite the obvious initial challenges, and provides some valuable best practice and 'lessons learned' for the future, notably with the establishment of a School Teaching and Learning Committee in 2020, which is working to embed technology-enhanced teaching and close the loop between student feedback and module enhancement.

Recommendations

- 7.13 The Review Group would encourage the School to maintain and develop the School Teaching and Learning Committee, and to consider the creation of a School Staff-Student Liaison Committee to supplement the Engineering Staff-Student Liaison Committee as a source of in-trimester feedback on modules.
- 7.14 The School Profile compiled by UCD Institutional Research in 2020 records one academic staff member with a teaching qualification, and three entrants to University Teaching and Learning Professional Programmes in the period 2015/16 to 2018/19. The Review Group recommends that a majority of the academic staff in the School should have a teaching qualification before the next Periodic Quality Review.

- 7.15 The School should ensure that it adheres to Academic Regulation 4.16 on the internal moderation of all coursework assessments and final examinations in all taught modules.

- 7.16 The Review Group recommends that the Head of School makes an allocation in the budget to ensure that technical staff have adequate opportunities for training and development in their field.

8. Support Services

General Comments and Context

- 8.1 The School engages with a wide range of supports and services provided by other UCD units, including the College and Programme Office, UCD Registry, UCD HR, UCD Estates, UCD Research and Innovation, UCD IT Services, UCD Library, and UCD Careers Network.
- 8.2 The Review Group had the opportunity to meet with representatives from a broad range of UCD support services, all of whom provided evidence of positive and productive relationships with the School.
- 8.3 Feedback from the School indicates that, for the most part, staff in the School have a positive perception of the services provided by University support services, but issues were noted in connection with the support for teaching from IT Services, in particular in relation to the use of Virtual Private Networks for online module delivery during COVID-19, and with the efficiency of HR processes for the recruitment of postdoctoral research staff.
- 8.4 The School used the Periodic Quality Review process to survey staff on their experiences of UCD support units, not to review the School's own effectiveness in liaising with these support units, or to reflect on how organisational structures at School level can be optimised to engage with the range of University supports available.

Commendations

- 8.5 The Review Group commends the strong individual working relationships between members of the School and staff in support units, in particular the Programme Managers, ME Internship Managers, and other College Office staff.
- 8.6 The Review Group also commends the engagement of the School's administrative staff in the emerging Communities of Practice networks for School Managers and for Research Managers and Administrators.

Recommendations

- 8.7 The Review Group recommends that the School strengthens its collaboration with the newly appointed College Educational Technologist as part of its ongoing commitment to curriculum development and module enhancement.
- 8.8 The Review Group notes that there is scope for the School to build stronger relationships with support units beyond the College, in particular UCD Library, UCD Careers Network, and UCD Global, and to improve reporting and awareness within the School of key initiatives such as the Career Mentoring Programme. Consideration should be given to the appointment of faculty members as direct points of contact with key stakeholders such as the College Liaison Librarian and UCD Careers and Skills Consultant.

- 8.9 The Review Group recommends that mechanisms should be established by the School for the regular feedback of IT problems from School staff to the College IT Committee, through the School faculty representative, or directly to a School or College liaison within IT Services.
- 8.10 The Review Group recommends that the School establishes a working group of staff with experience of postdoctoral recruitment to liaise with the College HR Partner and HR Resourcing Consultant to advise on the procedures currently in place and address the key issues.

9. Collaborative Educational Provision

General Comments and Context

- 9.1 The School's collaborative educational provision is mainly focused on the two BE programmes offered at BDIC. As described in section 4, these two programmes are delivered to around 500 students (200 FTE), with 8 School staff involved in the teaching delivery in Beijing. Each staff member delivers an average of 3.5 modules or supervises approximately 30 project students, or a mixture of both.
- 9.2 The BDIC fee income is handled differently to other teaching fee income at UCD, whereby the income appears as 'other income', which is used to offset direct expenditure. The reason is that the 5-year BDIC contract is handled as a lump sum payment, which is managed at School level in order to avoid foregoing some of this income to central UCD accounts. In the ramp-up period of the BDIC since its introduction in 2012, it has been a net contributor to the School, but the excess of income over expenditure is projected to decrease in the longer term.
- 9.3 There is a considerable variation in the contractual status of BDIC staff, which is linked to the ongoing viability of the arrangement with BJUT. This situation can lead to a precarious contractual situation for BDIC staff.
- 9.4 Oversight of the College Educational Provision is managed through the following: Firstly, the two programmes have their own Subject Extern Examiner. Secondly, the Programme Coordinator role in Dublin is matched with an equivalent coordinator in Beijing who is responsible for coordinating staff at BJUT and obtaining approval for any changes. Thirdly, there is the Joint Management Committee (JMC) that makes high-level strategic decisions like the creation of new programmes and setting new quotas.
- 9.5 Lecturers report that they find the lack of competent/qualified Teaching Assistants (TAs) in Beijing to be a particular challenge; whilst all BDIC staff have the option of one PhD student funded by the School, these can only be used for a maximum of 3 months. The requirement for more TA support means that in practice BDIC undergraduates are employed as TAs even though they are often not sufficiently qualified/experienced to be put in charge of labs in Beijing.

Commendations

- 9.6 The Review Group commends the School for its contribution to two of four programmes at BDIC, with the School identified by the BDIC Provost as the 'anchor tenant'. The significance of this should not be understated and the BDIC staff clearly carry a large and intensive teaching load for part of the year. These two programmes are very successful and BDIC is an important source of income for the School. There is a strong sense of community and mutual support amongst BDIC staff.
- 9.7 The School is now starting to build its research collaborations with BDIC including a recent successful joint workshop. The School should continue to build on the success of BDIC activities, and capitalize on this through more research-related opportunities with Chinese partners.

- 9.8 The Head of School has sought to support BDIC staff's research activities through the provision of a School-funded PhD position for each staff member. This PhD student accompanies the staff member to Beijing to act as a TA.

Recommendations

- 9.9 The Review Group recommends that the School considers the ways in which BDIC can be highlighted as a potential destination for outgoing UCD exchange students, given that 50% of lectures there are from UCD staff. The good match of the new Electronic and Information Engineering programme (for UCD students) means that the possibility of spending a semester/year in Beijing should become increasingly attractive for UCD students in the future.
- 9.10 The Review Group recommends that the School considers whether it might be possible to spread the load of the BDIC teaching across more individuals, meaning more colleagues involved with shorter stays rather than four months, as well as taking continued concerted efforts to address the variation and uncertainty relating to BDIC contracts.
- 9.11 From a risk management perspective, the Review Group recommends that the School seeks complementary collaborative education provision opportunities, e.g. with partner institutions within Europe and/or the Universitas 21 network.

10. External Relations

General Comments and Context

- 10.1 The School has well-established contacts and partnerships with industries and other universities both in Ireland and abroad.
- 10.2 The staff members within the School are involved with professional societies, in the organisation of and participation in conferences and other scientific events. The School has many links with other universities through exchange programmes, which mainly involve China and other English-speaking countries. Links with industries are mainly based on research collaborations and student internships.
- 10.3 The links with China are strong and great effort and resources are dedicated to this relationship. On the other hand, there is space for expansion especially with India (as the School has many incoming students from India) and Russia.
- 10.4 The School is part of important consortia operating in different fields at national and international level, e.g. EERA Energy System Integration.
- 10.5 The School regularly organises meetings with industry representatives, who participate in a variety of activities, including offering internships, teaching (guest lectures) and undertaking collaborative research projects with staff in the School. The industry representatives and alumni interviewed by the Review Group expressed an interest in being kept up to date with what is going on in the School.
- 10.6 The Review Group was informed that the School was involved with a very successful College-level Engineering Graduates Association.
- 10.7 The School is promoting exchange programmes and internationalisation opportunities (e.g. internships abroad) for students. However, the number of the incoming students is higher than the number of outgoing students. Some alumni and industry representatives who the Review Group met expressed an interest in expanding the international experience in the profile of graduates to support their staff recruitment and internationalisation strategies.

Commendations

- 10.8 The Review Group commends the large number of opportunities for internship programmes for ME students in industries. The enrolling process is administered by the internship office within the College and supported by the College which is actively engaged in promoting internships and in the follow-up of the related activities in order to assess suitability for all the students.
- 10.9 The Review Group commends the strong involvement in BDIC especially in teaching with hiring of new staff and support to the teachers aimed to improve teaching activities.

Recommendations

- 10.10 The Review Group recommends that the School continues to maintain and further promote formal connections with external stakeholders. In accordance with the School Strategic Plan, the Review Group supports the School's proposal to establish an Industrial Advisory Board (see also 5.13).
- 10.11 The Review Group recommends that the School be more active in improving its presence on websites and social media in order to better compete with other universities in attracting partners and external students.
- 10.12 The main focus of the School is on the national context, and the Review Group recommends that the School adopts a more international approach in a wide range of areas, including student and staff mobility, and research collaboration.
- 10.13 The Review Group recommends that the School works to increase outward student mobility both for exchanges and internships. At present, exchanges are predominantly with China or English-speaking countries. The School is encouraged to exploit the resources of UCD Global, in particular the Rowan database, to explore links with new EU partner universities which have relevant course offerings, and which teach through English e.g. in the Netherlands.

UCD School of Electrical & Electronic Engineering – Full List of Commendations and Recommendations

This appendix contains a full list of all commendations and recommendations made by the Review Group for the UCD School of Electrical & Electronic Engineering and should be read in conjunction with the specific chapters above.

Please note that the paragraph references below refer to the relevant paragraphs in the report text.

Organisation and Management

Commendations

- 2.9 There is a positive atmosphere and sense of collegiality within the School, particularly amongst the academic staff, including BDIC staff, which has been fostered by the current leadership of the School. The Head of School has demonstrated strong leadership and vision across all areas of School activity throughout his tenure. As staff numbers have increased in recent years, he has developed effective strategies to ensure better integration of BDIC staff.
- 2.10 School role holders are highly knowledgeable and engaged around their particular roles. Three members of the School staff hold College and University roles (UCD Vice-President for Research, Innovation and Impact; College Vice-Principal for Research, Innovation & Impact; College Vice-Principal for EDI) reflecting the School's strong engagement with and commitment to the University's values.
- 2.11 Strong student recruitment, success in securing research grants, and initiatives such as the establishment of the BDIC programmes have ensured that the School is in a sound financial position.

Recommendations

- 2.12 Succession planning for the Head of School, whose term of office comes to an end in August 2021, needs to be addressed as a matter of urgency, in line with the University Head of School Appointment Process (statute 6, chapter 17). More generally, short and long-term succession planning, including for Technical Staff and BDIC staff, should be conducted to ensure that retirements and role changes are managed with minimal disruption to School operations. This process should take account of changing disciplinary and support needs within the School.
- 2.13 The current workload model should be reviewed to ensure transparency, accountability and equality of opportunity to pursue different activities. The value of introducing a School sabbatical leave rota should be considered as part of this process. Scope for flexible working patterns and hybrid working arrangements should also be considered, drawing on the experience of COVID-19, both to benefit staff and, potentially, to find creative solutions to the current shortage of office space (see section 3). Any flexible working arrangements must ensure equity and fairness for all staff. The roles and responsibilities of staff in the School Office

should be made clearer to other staff across the School. The possible benefits of greater flexibility in roles and knowledge sharing for School Office staff should be considered (e.g. to assist in facilitating annual leave or managing tasks if a staff member is ill).

- 2.14 The Review Group recommends that the School review its requirement for PhD students to act as Teaching Assistants (TAs) across all years of their studies. The remuneration policy for TA duties should also be reviewed and benchmarked against practice elsewhere in the College, the University and in other institutions.
- 2.15 Ways of enhancing the sense of community and collective identity among post-doctoral researchers, research administrators and postgraduate research students should be explored by building academic and social links between labs and research groups, for example via School research symposia.

Staff and Facilities

Commendations

- 3.10 The Review Group noted a committed faculty and staff with a number of faculty in leadership roles at College level. It also commends the excellent levels of support across the full range of School activities provided by technical staff, administrative staff in the School Office team, and administrative staff attached to funded research projects.
- 3.11 A large number of faculty have been recruited to the School since the last Quality Review, in part with external funding, and this has facilitated the development of new programmes and disciplines.
- 3.12 New administrative staff have been recruited to the School Office shared with the School of Mechanical & Materials Engineering, and the School Plan has the budget in place to recruit technical staff to replace future retirements.

Recommendations

- 3.13 In collaboration with the new College Vice-Principal for Development and other Schools within the College, the Review Group recommends that the School continues to seek ways to expand and update space/facilities through the development of a School Master Plan, which takes into account the need for integrated research collaboration, the facilitation of flexible working arrangements, and the use of shared office spaces, especially in relation to COVID-19 social distancing requirements.
- 3.14 The Review Group recommends that the School develops a plan of action in collaboration with the HR Partner, HR Resourcing Consultant and the College Athena SWAN committee, to improve gender balance among faculty, especially at early career and senior levels, e.g. via the SALI scheme, Ad Astra opportunities, or reactive and strategic recruitment schemes.
- 3.15 Existing School practice around induction/onboarding should be further developed and formalised for all new academic, research, and administrative staff. The formal induction process should be conducted by the Head of School or designated manager in line with the

UCD Probation Periods Policy. Advice on the promotion process for academic staff should form part of annual P4G conversations.

- 3.16 Provision should be made in the teaching and administrative workload allocation for faculty to apply for sabbatical leave.
- 3.17 Recruitment of staff should follow College and University policy, procedures and practice. All posts, including externally-funded research staff, should be advertised to ensure transparency and adherence to best practice on recruitment and reporting.
- 3.18 Academic staff must comply with the University's policy on consultancy and submission of annual returns.

Teaching, Learning and Assessment

Commendations

- 4.8 The Review Group commends the School for continually offering a very broad yet high-quality standard of teaching across the whole Electrical & Electronic Engineering spectrum, with strong success/completion rates and a strong link to industrial stakeholders. Students report a high level of satisfaction with taught undergraduate and postgraduate courses, with a high degree of flexibility in terms of specialisation. Despite the large number of programmes and modules offered within the School and in collaboration with other Schools, there is a limited amount of overlap between these. Where there is, this is felt by students to be beneficial in order to consolidate learning and emphasize similar concepts in diverse contexts. Students reported being supported at crucial decision-making times through the degree programme and found that lecturers were very approachable. The increasing number of students who are satisfied with the design and delivery of the programmes testifies both to the quality of the programmes and of the teaching. In particular, interdisciplinary programmes in Engineering are very successful.
- 4.9 The Review Group particularly commended the Professional Work Experience module and the School's success in placing students with local industry. The internships are an important and valuable part of the student experience. Last year a total of 82 students from the School undertook internships with 43 employers. Both students and industrial hosts report high levels of satisfaction with this opportunity, which provides an important strategic industrial link for the School. ElecSoc (the student society) is also active in promoting links with the profession: it has strong links with the Institute of Electrical and Electronic Engineers (IEEE), and the School recently received a congratulatory message from the IEEE for the engagement of the society.
- 4.10 The impact of COVID-19 on teaching and learning has been challenging for the School, with systemic University-level problems affecting the School and students (e.g. the shift to continuous assessment; and the removal of the study week prior to autumn exams). In response, the School is looking at options relating to remote assessment. On the technology front, staff in the School took advantage of funding available from the University for additional equipment to support delivery of online teaching and assessment. Whilst examination integrity is still a significant challenge, assessment processes are generally judged as satisfactory by the students, despite the trend towards more Continuous Assessment (CA),

requiring careful management of deadlines across modules to avoid 'spikes' in submission dates towards the end of the semester.

Recommendations

- 4.11 The Review Group recommends that the School continue to explore ways of increasing awareness and participation in international study opportunities. This includes but is not limited to the ERASMUS+ and ERASMUS programmes. If language and programme content matching is a key challenge, then priority should be on those regions / countries where this is not an issue. Opportunities need to be flagged up to students early on, whilst bearing in mind the desire to spend some time abroad and considering the GPA neutral approach to exchanges. In this context, exploiting the resources of the Rowan database and UCD Global's linkages is strongly recommended.
- 4.12 The Review Group recommends that the School considers how to retain the best aspects of the new forms of teaching, learning and assessment developed during COVID-19. It should also take further measures to close the loop between student feedback and module coordinators. Research-led teaching could be further developed, with more guest lectures to illustrate industry relevance.
- 4.13 The School, in collaboration with the College widening participation committee, should expand their outreach activities and consider other strategies to increase the percentage of under-represented students to closer to the University target. There may be opportunities here to create a secondary schools liaison role and enhance online/remote teaching in close collaboration with the College Educational Technologist.

Curriculum Development and Review

Commendations

- 5.9 The Review Group commends the School for promoting collaboration/coordination with other Schools when the programmes require input from areas which exist outside the School, especially in relation to interdisciplinary programmes.
- 5.10 The Review Group commends the School for the quality of the curriculum and teaching provided which is recognised by industries. Internships are fully integrated into the programmes and are highly appreciated by the profession. Internship positions are made available for students through the traineeship office. The accreditation process ensures that the needs of the relevant professions are fully met. The technical skills and the strong focus on fundamentals of Engineering make UCD students/graduates very prepared for work and very flexible, able to face any kind of technical problems and to be active in designing new solutions.
- 5.11 The Review Group commends the procedure for quality assessment for the teaching modules which is implemented through the presence of External Examiners, one for Biomedical Engineering and one for Electrical and Electronic Engineering. External Examiners play an important role in benchmarking with their own universities and other universities where they have served as External Examiners.

Recommendations

- 5.12 The Review Group recommends that the already excellent profile of School graduates be further enhanced to make them more attractive and better equipped for industrial employers. In particular the Python programming language does not yet seem to be extensively taught in the School, while it is largely used in industry and should be introduced as early as possible in the undergraduate curriculum; analogue Printed Circuit Board design is recommended rather than lower-level circuit theory/software; the regulatory landscape should be considered, which is especially relevant for modules/programmes relating to biomedical engineering and energy. Another area of improvement is in presentation and public speaking skills, which could be integrated into the undergraduate curriculum. This is particularly relevant when students/graduates enter multidisciplinary environments in industry. Also, ethics should be better addressed according to the recommendations of Engineers Ireland during the accreditation process. In general, transferable skills (such as presentation, public speaking, ethics, etc.) deserve higher consideration within programme outcomes and included in the curriculum.
- 5.13 The School should continue to maintain its excellent relationships with industry partners and seek to establish new ones, including also other collaborations, for example with hospitals or clinics, which might contribute to Biomedical Engineering, both in the design of the curriculum and for internships. The Review Group supports the School's proposal to establish an Industrial Advisory Board, identified as a core objective in the School Plan 2020-2024, in order to have formal relationships for curriculum development and revision (see also 10.10).
- 5.14 The Review Group recommends that the School builds on the findings of the Inclusive Teaching Pilot Study, carried out as part of the College Athena SWAN plan, in order to embed inclusive design and promote widening participation. The School should also further develop links with UCD Access and Lifelong Learning.
- 5.15 The Review Group recommends that the School considers the introduction of a reading week for undergraduate students in the first trimester.

Research Activity

Commendations

- 6.8 The Review Group commends the School for its success in winning research grants across three main areas of Electrical, Electronic (especially Communications and Integrated Circuits) and Biomedical Engineering, leading to substantial growth in recent years as manifested in the increase in academic staff numbers and research income. The School's strong research profile is demonstrated by large University and national (e.g. SFI) research centres, some significant European grants (Horizon, ERC) and much industrial collaboration, many of which include examples of world-leading research.
- 6.9 There is an excellent alignment between School research areas and the University's strategic themes (Creating a Sustainable Global Society; Transforming through Digital Technology; Building a Healthy World; and Empowering Humanity).

- 6.10 The School has a very strong publication output per member of academic staff, around double that of the College overall and competitive with, if not higher than, equivalent departments internationally. Almost all academic staff are actively engaging with national and international organisations beyond UCD, including as reviewers for journals, conferences and research proposals, and on committees and/or working groups of IEEE panels. Many of these activities result in awards and recognitions, which emphasize the impact achieved.

Recommendations

- 6.11 The School is encouraged to support staff in identifying suitable calls, and in grant-writing, as well as to improve the internal pre-submission peer-review process. There is good general support for grant writing across UCD but this could be more targeted within the School. An example from Computer Science is of a role dedicated to this in specific subject areas, funded by research funds within that School. An additional internal round of peer-review on grant applications should improve the success rates achieved.
- 6.12 The Review Group recommends that the School further promotes the building of European partnerships in order to encourage participation in EU research programmes. Staff members report that participation in EU funded research projects is challenging because their teaching, research and administration duties make it difficult to ringfence the significant amount of time required to prepare a grant application. Further, involvement in EU projects as Principal Investigator (PI) requires a considerable amount of administration and management, which can discourage potential applicants. The Review Group suggests creation of support organs helping in these activities, which should be assisted by centralized UCD support infrastructure.
- 6.13 The Review Group recommends that the School maintains its strong links with industrial stakeholders, both in research projects and for input to teaching. Industrial stakeholders and alumni might benefit from being more integrated with the School through occasional events. The potential for industrial co-funded PhD and postdoctoral positions should be explored.

Management of Quality and Enhancement

Commendations

- 7.9 Staff and students have engaged positively with the Periodic Quality Review process, and the School engages in a separate process of programme and subject review for successful accreditation by Engineers Ireland. External examining processes are robust, with positive feedback, and the School also receives high scores across all taught modules in the University-wide end-of-trimester Student Feedback process. Industry stakeholders attested to the Review Group that students are well qualified for internships and the workplace.
- 7.10 Staff engage with professional development opportunities, and in each of the years 2017/18 and 2018/19 two members of faculty were recipients of a University Teaching and Learning Award. Steps have been taken since the last Quality Review to improve the teaching quality of Teaching Assistants (TAs) with the introduction of a compulsory training module (EEEN40530 Teaching Assistant in EECE) and a TA Performance Oversight Committee.

- 7.11 The University Regulations on the Structured PhD are fully embedded, with a School Graduate Research Governing Board, and up-to date records on individual student progress maintained by the School Office to ensure that each student is supported by a Research Studies Panel and carries out the Transfer Assessment to progress from Stage 1 to Stage 2 of the PhD within the allotted time frame.
- 7.12 The Review Group found that the shift to online teaching during the COVID-19 pandemic has worked well, despite the obvious initial challenges, and provides some valuable best practice and 'lessons learned' for the future, notably with the establishment of a School Teaching and Learning Committee in 2020, which is working to embed technology-enhanced teaching and close the loop between student feedback and module enhancement.

Recommendations

- 7.13 The Review Group would encourage the School to maintain and develop the School Teaching and Learning Committee, and to consider the creation of a School Staff-Student Liaison Committee to supplement the Engineering Staff-Student Liaison Committee as a source of in-trimester feedback on modules.
- 7.14 The School Profile compiled by UCD Institutional Research in 2020 records one academic staff member with a teaching qualification, and three entrants to University Teaching and Learning Professional Programmes in the period 2015/16 to 2018/19. The Review Group recommends that a majority of the academic staff in the School should have a teaching qualification before the next Periodic Quality Review.
- 7.15 The School should ensure that it adheres to Academic Regulation 4.16 on the internal moderation of all coursework assessments and final examinations in all taught modules.
- 7.16 The Review Group recommends that the Head of School makes an allocation in the budget to ensure that technical staff have adequate opportunities for training and development in their field.

Support Services

Commendations

- 8.5 The Review Group commends the strong individual working relationships between members of the School and staff in support units, in particular the Programme Managers, ME Internship Managers, and other College Office staff.
- 8.6 The Review Group also commends the engagement of the School's administrative staff in the emerging Communities of Practice networks for School Managers and for Research Managers and Administrators.

Recommendations

- 8.7 The Review Group recommends that the School strengthens its collaboration with the newly appointed College Educational Technologist as part of its ongoing commitment to curriculum development and module enhancement.
- 8.8 The Review Group notes that there is scope for the School to build stronger relationships with support units beyond the College, in particular UCD Library, UCD Careers Network, and UCD Global, and to improve reporting and awareness within the School of key initiatives such as the Career Mentoring Programme. Consideration should be given to the appointment of faculty members as direct points of contact with key stakeholders such as the College Liaison Librarian and UCD Careers and Skills Consultant.
- 8.9 The Review Group recommends that mechanisms should be established by the School for the regular feedback of IT problems from School staff to the College IT Committee, through the School faculty representative, or directly to a School or College liaison within IT Services.
- 8.10 The Review Group recommends that the School establishes a working group of staff with experience of postdoctoral recruitment to liaise with the College HR Partner and HR Resourcing Consultant to advise on the procedures currently in place and address the key issues.

Collaborative Provision

Commendations

- 9.6 The Review Group commends the School for its contribution to two of four programmes at BDIC, with the School identified by the BDIC Provost as the 'anchor tenant'. The significance of this should not be understated and the BDIC staff clearly carry a large and intensive teaching load for part of the year. These two programmes are very successful and BDIC is an important source of income for the School. There is a strong sense of community and mutual support amongst BDIC staff.
- 9.7 The School is now starting to build its research collaborations with BDIC including a recent successful joint workshop. The School should continue to build on the success of BDIC activities, and capitalize on this through more research-related opportunities with Chinese partners.
- 9.8 The Head of School has sought to support BDIC staff's research activities through the provision of a School-funded PhD position for each staff member. This PhD student accompanies the staff member to Beijing to act as a TA.

Recommendations

- 9.9 The Review Group recommends that the School considers the ways in which BDIC can be highlighted as a potential destination for outgoing UCD exchange students, given that 50% of lectures there are from UCD staff. The good match of the new Electronic and Information Engineering programme (for UCD students) means that the possibility of spending a semester/year in Beijing should become increasingly attractive for UCD students in the future.

- 9.10 The Review Group recommends that the School considers whether it might be possible to spread the load of the BDIC teaching across more individuals, meaning more colleagues involved with shorter stays rather than four months, as well as taking continued concerted efforts to address the variation and uncertainty relating to BDIC contracts.
- 9.11 From a risk management perspective, the Review Group recommends that the School seeks complementary collaborative education provision opportunities, e.g. with partner institutions within Europe and/or the Universitas 21 network.

External Relations

Commendations

- 10.8 The Review Group commends the large number of opportunities for internship programmes for ME students in industries. The enrolling process is administered by the internship office within the College and supported by the College which is actively engaged in promoting internships and in the follow-up of the related activities in order to assess suitability for all the students.
- 10.9 The Review Group commends the strong involvement in BDIC especially in teaching with hiring of new staff and support to the teachers aimed to improve teaching activities.

Recommendations

- 10.10 The Review Group recommends that the School continues to maintain and further promote formal connections with external stakeholders. In accordance with the School Strategic Plan, the Review Group supports the School's proposal to establish an Industrial Advisory Board. (see also 5.13)
- 10.11 The Review Group recommends that the School be more active in improving its presence on websites and social media in order to better compete with other universities in attracting partners and external students.
- 10.12 The main focus of the School is on the national context, and the Review Group recommends that the School adopts a more international approach in a wide range of areas, including student and staff mobility, and research collaboration.
- 10.13 The Review Group recommends that the School works to increase outward student mobility both for exchanges and internships. At present, exchanges are predominantly with China or English-speaking countries. The School is encouraged to exploit the resources of UCD Global, in particular the Rowan database, to explore links with new EU partner universities which have relevant course offerings, and which teach through English e.g. in the Netherlands.

UCD School of Electrical & Electronic Engineering Response to the Review Group Report

The task of developing the Self-assessment Report was a valuable reflective exercise, which facilitated the School to review its position from a number of perspectives, highlight and confirm our strengths and opportunities, identify areas of good practice and evaluate our weaknesses and challenges in a systematic way. The Review Group Site Visit was a positive and constructive experience. We welcome the endorsement of the Review Group for our activities through commendations and will carefully consider the recommendations during the Quality Improvement Planning process.

There was a high level of engagement from all staff and from the student community, both in compiling the Self-Assessment Report and in interacting with the Review Group during the site visit. The School wishes to thank the Review Group for their time, expertise and constructive comments, both during the visit and in their helpful Report.

The School will prepare a detailed Quality Improvement Plan (QIP) outlining how it proposes to implement the Report recommendations.

With specific reference to the prioritised recommendations identified by the Review Group, the School's initial proposals/comments are outlined below.

2.12 Succession planning for the Head of School, whose term of office comes to an end in August 2021, needs to be addressed as a matter of urgency, in line with the University Head of School Appointment Process (statute 6, chapter 17). More generally, short and long-term succession planning, including for Technical Staff and BDIC staff, should be conducted to ensure that retirements and role changes are managed with minimal disruption to School operations. This process should take account of changing disciplinary and support needs within the School.

Expressions of Interest for the role of Head of School were invited by the Head of College, with a closing date of 31 May 2021. We fully expect the new Head of School to be selected in June and in post by 1 September 2021. The School is currently evaluating its IT support needs and will initiate a strategic review of its technical support needs, taking into account changing disciplinary needs. It will also review the staff plan for BDIC.

2.13 The current **workload model** should be reviewed to ensure transparency, accountability and equality of opportunity to pursue different activities. The value of introducing a School **sabbatical leave rota** should be considered as part of this process. Scope for flexible working patterns and hybrid working arrangements should also be considered, drawing on the experience of COVID-19, both to benefit staff and, potentially, to find creative solutions to the current shortage of office space (see section 3). Any **flexible working arrangements** must ensure equity and fairness for all staff. The **roles and responsibilities** of staff in the School Office should be made clearer to other staff across the School. The possible benefits of greater flexibility in roles and knowledge sharing for School Office staff should be considered (e.g. to assist in facilitating annual leave or managing tasks if a staff member is ill).

The workload model will be reviewed as recommended, along with the process for applying for sabbatical leave. The possibility of introducing a sabbatical leave rota will be considered.

Flexible working arrangements are currently being reviewed at the University level. The School will implement the planned university-wide policy for flexible working which is expected to be announced in July 2021.

The School will ensure that roles and responsibilities of the members of staff in the School office are detailed on the School website. This current structure provides flexibility in roles and knowledge sharing across the Schools' Office staff, which facilitates annual leave or managing tasks if a staff member is ill, and a training and development pipeline for the Schools' Office staff across key strategic and operational areas.

2.14 *The Review Group recommends that the School review its requirement for PhD students to act as **Teaching Assistants (TAs)** across all years of their studies. The remuneration policy for TA duties should also be reviewed and benchmarked against practice elsewhere in the College, the University and in other institutions.*

A School-level review of the role of Teaching Assistants (TAs) within the School will be conducted before the 2021/22 academic year. This will include a review of the current requirement on all PhD students to act as TAs and remuneration of TAs, with benchmarking against other TA roles in other Schools. The review will be used to determine what changes may be desirable.

3.13 *In collaboration with the new College Vice-Principal for Development and other Schools within the College, the Review Group recommends that the School continues to seek ways to expand and update **space/facilities** through the development of a School Master Plan, which takes into account the need for integrated research collaboration, the facilitation of flexible working arrangements, and the use of shared office spaces, especially in relation to COVID-19 social distancing requirements.*

The School has appointed a School Faculty member as its representative on the newly created College Development Committee. The School is currently engaged in an internal consultative process to determine current and future space and facility needs, and to communicate these to the College and University for implementation.

3.14 *The Review Group recommends that the School develops a plan of action in collaboration with the HR Partner, HR Resourcing Consultant and the College Athena SWAN committee, to improve **gender balance among faculty**, especially at early career and senior levels, e.g. via the SALI scheme, Ad Astra opportunities, or reactive and strategic recruitment schemes.*

The School is aware of the need to improve gender balance among faculty. To address this, it will develop a plan of action in collaboration with the HR Partner, HR Resourcing Consultant and the College Athena SWAN committee to attract more female applicants to faculty positions within the School, leveraging the SALI and Ad Astra schemes where possible.

3.15 *Existing School practice around **induction/onboarding** should be further developed and formalised for all new academic, research, and administrative staff. The formal induction process should be conducted by the Head of School or designated manager in line with the UCD Probation Periods Policy. Advice on the **promotion process** for academic staff should form part of annual P4G conversations.*

The School's implementation of the induction process for new staff will be reviewed alongside the UCD Orientation Programme for New Employees and the Faculty Induction programme.

The requirement to comply with the Probation Periods Policy will be reiterated immediately with all new staff. The matter will also be discussed at the School Council meeting on 23 June. Furthermore, it will be highlighted to reviewers that advice on the promotion process for academic staff should be included as part of the annual P4G process.

7.15 *The School should ensure that it adheres to Academic Regulation 4.16 on the **internal moderation** of all coursework assessments and final examinations in all taught modules.*

The School will review processes for internal moderation across all modules to assess current practice and to ensure that these adhere to Academic Regulation 4.16. Guidelines and recommendations will be proposed and implemented where issues are identified.



Remote Site Visit Timetable - UCD School of Electrical & Electronic Engineering

SESSION 1

Friday, 12 February 2021	
Review Group Briefing Meeting	
<i>All times are local Irish time</i>	
16.00-16.30	Introductions; UCD Quality Office Lead briefing to Review Group members on the quality process; Run through technical platform, collaborative spaces, and any practicalities.
16.30-16.40	Break
16.40-17.30	Review Group Chair to lead discussion on preparation of Preliminary Comments on the Self-Assessment Report (SAR), preparations for the site visit, timetable, initial observations, information requests.

SESSION 2

Thursday, 11 March 2021	
Review Group Planning Meeting	
<i>All times are local Irish time</i>	
14.45	Virtual Meeting Room opened (UCD Quality Office Lead)
15.00-15.45	Preliminary Comments and areas for discussion – Review Group
15.45-16.00	Break
16.00-17.45	Timetable Review, assignment of Review Group roles for meetings/questions, additional information requests

SESSION 3

Thursday, 18 March 2021	
Review Group Meeting with Registrar & Deputy President	
Organisation/Management of Resources/Strategy	
<i>All times are local Irish time</i>	
13.30	Virtual Meeting Room opened (UCD Quality Office Lead)
13.45-14.00	Review Group only - preparation for meeting with the Registrar & Deputy President
14.00-15.00	Meeting with the Registrar & Deputy President
15.00-15.30	Review Group only – Key observations & preparation for next session
Friday, 19 March 2021	
Review Group Meeting with College Principal and Head of School	
Organisation/Management of Resources/Strategy	
<i>All times are local Irish time</i>	
13.30	Virtual Meeting Room opened (UCD Quality Office Lead)
13.45-14.00	Review Group only - preparation for meeting with the College Principal
14.00-14.45	Meeting with the Dean of Engineering & College Principal, UCD College of Engineering and Architecture
14.45-16.00	Review Group only - preparation for meeting with the Head of School
16.00-16.45	Meeting with the Head of School
16.45-17.00	Review Group only – Key observations & preparation for next session

SESSION 4

Monday, 22 March 2021	
Core Activities & Stakeholder Feedback	
<i>All times are local Irish time</i>	
13.30-14.00	Review Group only – preparation for session
14.00-14.45	SESSION 4.1, Stakeholder meeting – SAR Co-ordinating Committee
14.45-15.00	Review Group break
15.00-15.45	SESSION 4.2, Stakeholder meeting – Faculty
15.45-16.00	Review Group – Key observations & preparation for next session
Wednesday, 24 March 2021	
Core Activities & Stakeholder Feedback	
13.30-14.00	Review Group only – preparation for session
14.00-14.45	SESSION 4.3, Stakeholder meeting – Administrative and Technical Staff
14.45-15.00	Review Group break
15.00-15.45	SESSION 4.4, Stakeholder meeting – Programme Deans, Graduate School Director, College VP Research, College VP Global Engagement, College VP Development, BDIC Provost
15.45-16.00	Review Group – Key observations & preparation for next session
Thursday, 25 March 2021	
Core Activities & Stakeholder Feedback	
13.30-14.00	Review Group only – preparation for session
14.00-14.45	SESSION 4.5, Stakeholder meeting – College Finance Manager, HR Partner, HR Resourcing Consultant
14.45-15.00	Review Group break
15.00-15.45	SESSION 4.6, Stakeholder meeting – New Academic Staff
15.45-16.00	Review Group – Key observations & preparation for next session
Friday, 26 March 2021	
Core Activities & Stakeholder Feedback	
13.30-14.00	Review Group only – preparation for session
14.00-14.45	SESSION 4.7, Stakeholder meeting – Undergraduate and Taught Postgraduate students
14.45-15.00	Review Group break
15.00-15.45	SESSION 4.8, Stakeholder meeting – Research students
15.45-16.00	Review Group – Key observations & preparation for next session
Wednesday, 31 March 2021	
Core Activities & Stakeholder Feedback	
13.30-14.00	Review Group only – preparation for session
14.00-14.45	SESSION 4.9, Stakeholder meeting – Post-Doctoral Researchers and Research Support Staff
14.45-15.00	Review Group break
15.00-15.45	SESSION 4.10, Stakeholder meeting – School support service representatives
15.45-16.00	Review Group – Key observations & preparation for next session
Thursday, 1 April 2021	
Core Activities & Stakeholder Feedback	
14.30-15.00	Review Group only – preparation for session
15.00-15.45	SESSION 4.11, Stakeholder meeting – Alumni & Employers
15.45-16.00	Review Group break
16.00-16.45	SESSION 4.12, Stakeholder meeting – BDIC Academic Staff
16.45-17.00	Review Group break
17.00-17.20	SESSION 4.13, Stakeholder meeting – Alumni & Employers (cont'd)
17.20-17.30	Review Group – Key observations & preparation for next session

SESSION 5

Tuesday, 6 April 2021	
Exit Presentation - Preparation	
<i>All times are local Irish time</i>	
14.00-15.00	Review Group only – preparation for Exit Presentations
Wednesday, 7 April 2021	
Exit Presentations – Review Key Findings	
15.00-15.30	Review Group only – preparation for Exit Presentations
15.30-15.50	SESSION 5.1, Review Group key findings (commendations and recommendations) Meeting with the College Principal, UCD College of Engineering and Architecture; and UCD Director of Quality
15.50-16.00	Review Group break
16.00-16.20	SESSION 5.2, Review Group key findings (commendations and recommendations) Meeting with the Head of School; and UCD Director of Quality
16.20-16.30	Review Group break
16.30-16.50	SESSION 5.3, Review Group key findings (commendations and recommendations) Meeting with the Head of School; all School staff; and UCD Director of Quality
16.50-17.00	Review Group only – Remote Site Visit close out & next steps

SESSION 6

Thursday, 15 April 2021	
Review Group Drafting Session 1	
<i>All times are local Irish time</i>	
15.00-17.00	Review Group Drafting Session 1

SESSION 7

Thursday, 29 April 2021	
Review Group Drafting Session 2, w/ sign-off	
<i>All times are local Irish time</i>	
14.00-16.00	Review Group Drafting Session 2, with sign-off on Report