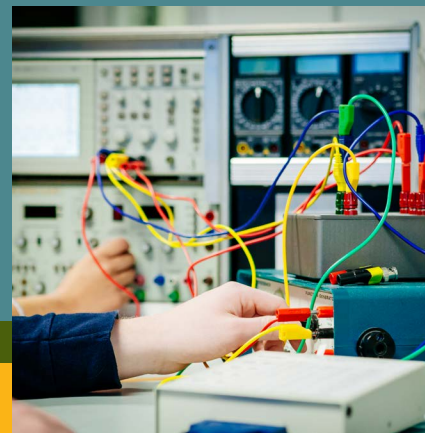DCU
Ollscoil Chathair
Bhaile Átha Cliath
Dublin City University

Faculty Strategic Plan Engineering and Computing

Strategy Statement

2017 - 2022

Contents

Dublin City University

Introduction

The Faculty of Engineering and Computing in DCU, based on the Glasnevin Campus, comprises three Academic Schools (Computing, Electronic Engineering, and Mechanical and Manufacturing Engineering) and associated Research Centres which include SFI-funded centres/projects/spokes, nodes of university or national centres, local and smaller research teams.

Our distinct focus is technology; specialisms that place us at the centre of innovations that will define and deliver future economic progress, while shaping how people and organisations interact, and operate, in decades to come.

The Faculty plan, which is the result of extensive consultation at School and Faculty level, is structured so as to reflect the centrality of two interconnected aspects of our activities: Education and Research /Innovation. Our teaching must be led by disciplinary and pedagogical research; teaching benefits our research.

People (students, staff and stakeholders) are at the core of both, and so are central to our plan.

The Faculty developed its plan in the context of a rapidly changing technological environment, but also within a competitive regional landscape, and against a backdrop of recognised underfunding of the sector and enormous demand nationally and globally for the skill-sets of our graduates. Importantly, we were building on a track record of very significant achievements in both research and teaching, guided by a clear university plan (which resonates with our identity and ambitions) and by our values of excellence, student-centeredness and industry focus.

With the significant capacity we have to deliver impact comes a responsibility to be ambitious, to demand high standards, act responsibly and with integrity, and to take a long term and global view. We were conscious that making an important contribution to what is essentially a technologically-driven re-shaping of how we live and work will demand that the Faculty deepen and broaden its research impact, while also ensuring its graduates are equipped to play a role as effective, responsible, innovative leaders.

We claim national leadership in distinct fields, but the key challenges that can be addressed through design, technology and innovation are global in nature. This reflects in global opportunities for our graduates, and in the global networks required to deliver our research impact. As such, full engagement with the DCU internationalisation strategy is particularly important to us and is integrated within our Education and Research priorities.

We identify that co-location of computing and engineering competencies in the Faculty is a significant strength, not only in terms of the agility and integration that can be achieved across research areas, but also with regard to the richness that can be delivered through our taught programmes. We recognise that inter-Faculty collaborations and our partnership with students, DCU-Alpha, alumni, the broader DCU innovation ecosystem and external stakeholders are key as assets in delivering on our research, innovation and teaching mission.

This plan is owned by everybody in the Faculty. Its implementation will be led by the Executive Dean and the Faculty Management Board, assisted by individual leaders of key projects. We are committed to active monitoring, review and effective communication of progress.

Institutional Strategic Context
The Faculty of Engineering and Computing Strategic Plan is consistent with the nine overarching goals of the university plan (Talent, Discovery, and Transformation, DCU Strategic Plan, 2017-2022) and we are well positioned to make a strong contribution to many aspects of the five DCU constituent plans which relate to Teaching and Learning, Research and Innovation, Student Experience, Engagement and Internationalization. The Faculty plan, however, also reflects analysis of the strengths, challenges and contexts that are specific to our disciplines.

Statements of Strategic Intent

While the Faculty comprises a set of technology disciplines we keep people firmly at the centre of our focus -specifically students, staff and a wide variety of stakeholders. Our strategic intentions are framed accordingly.

Education

We aim to provide a transformative student experience and deliver innovation, and significant societal and economic benefit through the achievements of our graduates.

Student success based on active engagement with our programmes is central to this goal. Our impact depends on the quality, number and diversity of our graduates. The context in which we deliver this impact is a changing one, both in terms of students and in digital technologies.

Therefore, it is our strategic intent to:

1.1 Optimise the learning gain achieved by each of our students over the course of their programme.

This includes focusing on the related issues of student transitions (orientation, points of change), student learning experience, behaviours and mindset, student-centred curriculum and assessment design, inclusion, and effective learner supports. Academic excellence underpins this intent. Success will be reflected in student performance, completion rates and completion times.

Industry engagement will continue to be integral to the student learning experience, and we will develop this beyond INTRA into other elements of the curriculum such as industry-led team based challenges. We will ensure that our students are exposed to the research work of the Faculty and to the contribution it makes. We will support co-curricular and volunteer opportunities for learning relevant to the programmes, particularly those which provide opportunity to engage meaningfully with the challenges of the UN sustainable development goals, social or commercial entrepreneurship. We will develop student experiences which build a sense of belonging, confidence, trust and connection between students, and students and staff. We will leverage digital tools and resources to provide opportunities for adaptive learning, self-testing, enhanced class interaction and group work, and contribute to the development of learning spaces which allow flexibility and promote engagement. Degree programmes will be reviewed for the opportunities students have for an international learning experience and plans developed to extend these.

We will broaden our learning support environment to include well supported and managed contributions from peer tutors, UG teaching assistants, postgraduate researcher tutors and demonstrators, as well as from postdoctoral researchers.

We will develop and adopt competency frameworks for employability skills. NStEP, Partnership with the Office of Student Life, Student Support and Development, DCU Alpha and the Alumni community will be integral to this goal. We will place particular emphasis on engendering a mutually beneficial relationship between students and our alumni.

1.2 Actively support staff to continually enhance their Teaching and Learning knowledge and practice.

This includes the introduction of mechanisms to support staff mobility, engagement with CPD opportunities to explore best practice internationally or develop international partnerships underpinning T&L excellence, undertaking research and/or developing and publishing leading practice. Specific dimensions of this intent are competencies related to digitally enhanced approaches to teaching and learning, and student-centred teaching, universal design for teaching, assessment and curriculum design. We will also become active in international networks focused on the teaching of our disciplines.

1.3 Improve the quality, strength of preference and number of applicants for our undergraduate programmes.

A review of undergraduate curriculum and programme titles will be undertaken to reaffirm alignment with state-of-field, and consider how they are perceived/promoted in terms of currency and relevance. A specific campaign to promote and grow applications to newer degrees to sustainable levels will be undertaken.

We will develop a new, broad-based undergraduate programme which will have wide appeal, a perception of do-ability and suitability for the technology augmented workplaces of the future and addresses possibilities at the intersections of creative processes and technological innovation.

We will develop and promote a distinctive reputation for exceptional depth and breadth of student engagement, industry-led activities and a genuinely inclusive culture.

We will establish more flexible pathways for students who want to progress in a way that differs from their original choice.

Our professional support for marketing and recruitment will be enhanced and co-ordinated effectively with those of the university. We will target existing and new outreach activity directly toward growing applications from qualified cohorts, particularly female students with higher mathematics backgrounds. In parallel, we will develop an outreach programme to assist those DCU partner schools with few students meeting that bar, to enhance achievement in maths, physics and/or computer science. The Faculty will take a lead institutionally and nationally in a campaign to translate achievements in leaving certificate higher mathematics, into enhanced take-up of technology degree options at third level, particularly among women, and especially in DCU.

1.4 Strengthen our impact at postgraduate level by further enhancing programme relevance and growing graduate numbers by adopting new modes of delivery.

We will develop a growth plan which attains a student mix profile that is consistent, according to international norms, with a research-led teaching environment.

A review of postgraduate taught curricula and programme titles will be undertaken to reaffirm alignment with state-of-field, and consider how they are perceived/promoted in terms of currency and relevance both in Ireland and internationally.

We will streamline marketing of PGT programmes within the professional support unit, and enhance cooperation with the university PG and the international office recruitment functions.

We will position ourselves to deliver specialist level 9 programmes to those in employment, particularly in areas identified as addressing national upskilling needs and including CPD and master's level opportunities for teachers of computer science at second level. We will engage with NIDL to implement evidence-led blended and online delivery initiatives to enhance the learning experience of our postgraduate students, and increase access to our programmes.

We will improve the rate at which DCU undergraduate students remain to complete a master's programme. We will leverage international partnerships to grow the numbers of students on our postgraduate programmes, and to open opportunities for global experiences for all our students.

(1.3 and 1.4) In our decision-making with regard to new programme development and curriculum renewal we will implement a process of strategic engagement with employers to identify future needs, trends and employability considerations.

1.5 Further internationalise the experience of our students, and our impact on learners globally.

We will identify and apply best practice in providing international and intercultural experiences for our students. This will include incorporating opportunities for global engagement through revised programme structures or via in-module opportunities such as collaborative projects with international partners. We will further develop our delivery of curricula abroad (transnational education, TNE), with a specific emphasis on working with Chinese partners, and building on our experience in the Middle East. We will contribute to the development and implementation of a cross-university plan for internationalisation by developing a Faculty specific operational plan across five and ten year horizons. This plan will span the four pillars of internationalisation and exceed the university goals of 13% international students (7% studying for full degrees) by 2022.

1.6 Leverage our technology and research expertise to enhance the success of DCU students across disparate disciplines.

As technology and data competencies transform and infuse all sectors of the economy and society, DCU plans to incorporate appropriate levels of technology awareness in all the universities degree programmes. We will partner with other Faculties to ensure that our relevant expertise (including that in data analytics, design and creativity, systems-thinking, coding, and sustainability) is leveraged to deliver world-leading models of discipline-integrated, state-of-the art, rigorous approaches to this.

Research and Innovation

It is our mission to deliver significant societal and economic impact through our research, innovation and engagement activities.

The people, culture, facilities, networks and supports collectively enable fulfilling this mission. Only when these combine to deliver significant amounts of relevant, high quality, highly visible output and activities do we have significant impact.

Therefore, it is our strategic intent to:

2.1 Strengthen our Human Capital for research, and provide supports.

We wish to a) broaden the range of research active staff and b) strengthen the research trajectory of new staff and those for whom it has faltered. We will empower all academic staff to meet their full research potential by establishing a framework of defined priority areas/groupings, a system of mentoring, some targeted funding and the support of a Faculty-based Research Development Officer. The identified Faculty priority areas will map onto established and emerging research strengths and potential to deliver distinctive impact. In this context staff will be invited to develop a goal-driven personalized multi-annual research plan which targets milestones (such as meeting specific funding agency profile criteria), specific grants and specific professional development

(including travel or sabbaticals to acquire defined experience or strengthen networks and collaborations). Precedence for supports to implement plans will be given to academic staff who are currently less research active, are coming to the end of or are struggling to fund a research agenda or who are new staff. Evaluation of the quality of plans will be a rigorous but developmental process.

2.2 Grow our Human Capital for research and for research leadership.

We will implement the Researcher Career Framework with a particular focus on those at earlier career stage with the goal of positioning them to move toward full independence and being competitive for academic positions in the Faculty.

We will engage fully with DCU's initiative to introduce future research leaders 'research fellow/lecturer roles' and, where possible, leverage opportunities presented by specific external funding schemes to recruit research leaders in key areas.

All recruitment of academic staff (irrespective of term or the basis upon which the post is funded or justified) will require strong research achievements and trajectory and an ability to strengthen or add complementarity to research priority areas.

We will support research active staff to undertake University Leadership and Management training.

We will leverage new funding streams for PhD researchers, and improve our performance in fellowship-focused schemes at doctoral, post-doctoral and research levels.

2.3 Enhance Impact by improving the quality profile of research output and management of research resources.

In co-operation with the library and Quality Promotions Office we will develop and deploy discipline specific citation action plans, and implement in respect of individual researchers.

Dedicate Professional Support staff will be designated to research to enhance reporting, management of Faculty research schemes, communications and review of metrics.

We will engage actively with university structures to support internationalisation of research and leveraging of strategic partnerships.

2.4 Take a leadership position with regard to societal issues pertaining to data and research integrity (RI).

This includes building a technical expertise in Data/Citizen issues, engendering a culture infused with values underpinning RI and setting standards for excellence in research practice, to be reflected in the depth and quality of research proposals and pratice in the Faculty.

2.5 Lead in DCU, nationally and internationally in areas underpinning digital transformation.

Our research underpins the digital transformation of society, industry, commerce and healthcare. We will continue to lead in these technologies and their implementation. We will contribute to the university focus on innovation through our work in disruptive technologies, and will harness to best effect university-led initiatives and resources (makerspaces, creative product ideas, idea development support) to retain innovation our way of working.

Staffing and Facilities

We deliver on our mission through the work of our staff, who rely on the quality of our infrastructure, and effectiveness of our structures.

Therefore, it is our strategic intent to:

3.1 Ensure a state-of-the-art environment.

This will require that we generate non-exchequer and research funding to maintain our laboratories, learning and work spaces, replace and improve equipment. We will also work toward the building of a Future-Tech facility to support teaching and research in next generation technologies. Effective space, facility and IT management structures will be put in place.

3.2 Ensure that our professional, academic and technical staffing structures and skills sets are optimised to deliver on this strategy.

The university maintains a focus on operational excellence and strategic intelligence. Associated initiatives, such as introducing a new student information system, internationalisation, income generation and revising approaches to teaching and learning, all depend directly upon the roles, functions and skill sets of professional and technical staff. Processes, technologies and learning design are all changing. We will review staffing structures and support professional development to ensure required skill-sets are in place and effectiveness is high.

3.3 Foster distributed leadership as a support to succession planning.

Leadership has to be given opportunity to develop. It grows as a result of gaining experience, with increasing levels of responsibility and accountability, along with exposure to aspects of the wider context.Where possible and appropriate, we will empower staff at all levels, and in all roles, to take responsibilty for aspects of projects underpinning this strategic plan, in addition to giving due recognition and support to such individuals. We will focus in a deliberate way on research leadership in identified priority areas.

Influence and Effectiveness

Our impact, as dictated by our influence, relevance and effectiveness is heavily dependent on the quality, coherence, and extent of engagement with key stakeholders both internal and external We rely on all staff to contribute to this. All students and alumni are potential ambassadors and agents of action. We recognise that communication is the key ingredient. Partnership with communications expertise in the university will be important in delivering in this area.

It is our strategic intent to:

4. 1 Develop and implement an internal communications strategy.

This will focus on enhancing our sense of community, strengthening a shared culture and deeply embed ownership of delivering on our mission. All students and staff are very important in this, but we will also give particular consideration to identified groups such as student leaders, international students, newer staff, leadership across research centres and Schools. Enhanced reporting of key trends (internal and external) and metrics is part of this initiative. Working with the Communications and Marketing offices it is our intention to create a new calendar of reporting initiatives/events which will inform students and staff in a more deliberate and consistent way.

4.2 Develop and implement an external engagement/communications strategy.

We will continue to be proactive in engaging with external professional bodies, with industry leaders, government agencies, partner institutions (including secondary schools and teachers) and with alumni. We are active at all scales and, appropriate to our disciplines, mostly in three of the four dimensions of DCU's 4X4 engagement matrix. However, to maximise effectiveness we will become more deliberate and co-ordinated in aspects of our engagement, and developing a strategy will help us articulate specific goals and identify and action the many engagement activities which can help us deliver on those. To this end we will work closely with the Communications Department to ensure pro-active placement in traditional media and work to ensure that we leverage the web site and digital media to best effect.

4.3 Provide leadership in DCU in areas of Faculty expertise.

Technology, Sustainability, and Creativity are three of the six themes central to the university level plan, which is ambitious in terms of how aspects of these themes might be included in our education and research missions and in how we do things. Examples include a commitment to explore the possibilities arising at the intersections of creative processes and technological innovations, a university-wide initiative in Digital Transformation, a university focus on innovation (makerspaces, creative product ideas, idea development support), and one on operational excellence. In many instances the Faculty is home to leading expertise in the relevant area. We will be proactive in working with all other Faculties and with university central units to support delivery on these university ambitions, in a way which is distinguished by the quality of engagement by leaders in technology, data, systems, sustainability, and design.

Examples of Flagship Projects

Education

Feasú
The curriculum renewal project is one of the major vehicles to deliver the strategy.

IGNITE
The aim of IGNITE is to ensure that positive active engagement is fired from the day a student joins the Faculty so that they are empowered to be successful.

Digital Transformation
We will collaborate with the NIDL Ideas Lab to plan, manage and deliver programmes and shorter MOOCs which can be used to enhance significantly the online and blended delivery of our programmes.

Industry Forum
We will set up a new flexible industry advisory forum.

New Programme Development Initiatives
Both cross Faculty, inter Faculty, at undergraduate and postgraduate levels.

Internationalisation
We will develop and implement a plan which includes each of the four pillars of internationalisation.

FutureTech
We will help design world-leading facilities for teaching and research (for our domains) in the new building.

Research and Innovation

Research Prioritisation Exercise
Our goal is to harness research efforts in areas where we can achieve critical mass, build our distinctive strengths, as well as develop research in new areas of strategic importance.

Implementation of the Researcher Career Framework
With a goal of ensuring that DCU remains a university of choice for top class researchers in our fields.

ENGAGE
The ENGAGE project will develop tools and structures for staff research development, together with the planning and allocation of supports.

Research and the Citizen
Building expertise and profile in this area, particularly as it pertains to Data but also societal impact of our technologies and our responsibility as researcher educators.

Other Areas

Operational Excellence
We will collaborate with the OpEx initiatives at university level, working through Faculty specific processes and structures.
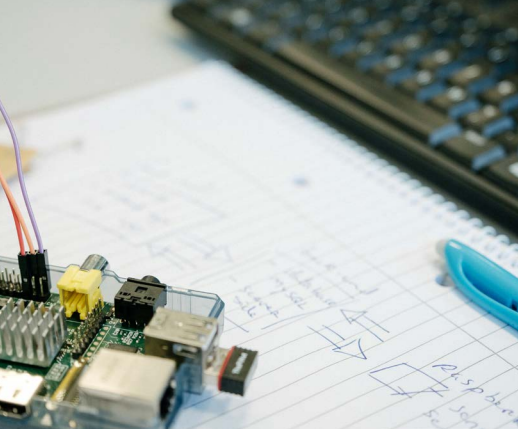
Communications and Engagement Strategies
Both internal and external.

Purposefully different, consistently excellent

Notes

dcu.ie/engineering_and_computing