Institute of Technology Sligo

Faculty of Engineering and Design

Programmatic Review

Report

Tuesday 7th & Wednesday 8th May 2019

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Part 1

Executive Summary

The Faculty of Engineering & Design, Institute of Technology Sligo undertook a review of its programmes during the academic year 2018-2019. A self-evaluation report was produced. An external peer-review panel was established by the Registrar. This panel met with staff on May 7th & 8th as both a collective cohort and then in Department groups. This report presents the findings of the panel.

The panel commended the Faculty on the rigorous process undertaken by the Faculty and Department teams in preparing for the programmatic review. A number of recommendations were made in relation to work placements, marketing of online programmes, further development of alumni relationships, capacity planning and strategies for increasing the intake of students identifying as other than male. In addition, Department and programme specific commendations and recommendations were advanced. A small number of conditions focusing on accuracy of documentation were also made.

Part 2

Introduction and Terms of Reference

This report outlines the proceedings of the programmatic review in the Faculty of Engineering & Design and the findings of the external panel of assessors Tuesday and Wednesday 7th & 8th of May 2019 respectively.

In accordance with the Quality Assurance Procedures of the Institute, a detailed evaluation and analysis of the content of modules and programmes must be carried out at least every 5 years. This is to ensure that the School updates its programmes and that they remain relevant to students and employers. It is also an opportunity to make the necessary changes to the programme structures and content to keep them current. Typically, the process takes 12 months to complete and the output is a set of documents that report on the findings of the self-evaluation and specify the Plans of the School and the proposed changes to the various programmes (with supporting justification).

The Panel examined how the School and each Department have achieved the objectives of the programme revalidation process.

These are to:

a. Propose improvements to programmes based on a formal feedback and evaluation process
b. Incorporate feedback from staff, student and employers into the revised programmes
c. Ensure that programmes remain relevant to learners needs, including academic and labour market needs
d. Ensure that learning modes are compatible with academic standards, coupled with the life style of learners
e. Achieve enhanced integration between all aspects of learning, teaching and research incorporating any new pedagogical thinking, where appropriate
f. To achieve revalidation of all programmes, incorporating the agreed changes (for up to a maximum of 5 years)

The Panel also considered the following:

a. How each Department has addressed and dealt with issues and questions raised in the last programmatic review.
b. The relationship of revalidation to the Strategic Plan of the School and the Institute
c. The contribution of active research to learning
d. Proposed changes to programmes submitted for revalidation by the Departments

The agenda for this meeting is contained in Appendix 1. Membership of the review panel is listed in Appendix 2. The list of documentation received by the panel is contained in Appendix 3.

Part 3 Private meetings of the Panel of Assessors

6.5.2019 19.00hrs; Clayton Hotel:

The chairperson provided panel members with an overview of the objectives of the Programmatic validation process and the general running order of the next two days. No further discussions took place, as not all panel members were in a position to attend.

7.5.2019

The Chairperson welcomed all panel members. Members were advised that the forthcoming discussion with the Institute and Faculty Senior Management should focus on issues they wished to explore in relation to the Institute's strategic plan and ascertain the progress made on conditions/recommendations since the Faculty review in February. Panel members were furnished with a copy of the validation report from the Faculty Review in February 2019 to inform their discussions**.**

The panel were also informed that the Faculty's research metrics in terms of capacity, research centres, plans etc. will require exploration as part of the validation process is to validate the Faculty's Level 9/10 research degrees.

The panel discussions highlighted a number of areas that panel members wished to address such as the strategy that IT Sligo deploy to keep their online delivery product contemporary and a leader in the HEI sector, the transferable skills students acquire through project work, work placement parameters/ guiding principles, the manner in which climate action and sustainability are addressed at programme level, strategies used to prepare students to work in the global engineering market; the manner in which a community of learning is created and cultivated in the online space, internationalisation, ethical and professional issues. It was agreed that the aforementioned topics should also frame the individual department discussions. A discussion on Gender was also deemed appropriate to ascertain how the Faculty are trying to address the current imbalance.

Part 4 Meeting with the Institute VP Academic Affairs/ Head of faculty

Mr Colin Mc Lean & Ms Una Parsons

The Chairperson introduced the panel members.

The Vice President for Academic Affairs represented the President, and gave a presentation Appendix 4) which provided an overview of the Institute in terms of its strategic plan, vision & mission, facilities, proposed infrastructural developments, achievements in the online teaching & learning space, range of international collaborations, TU ambitions and the required research metrics for attainment of same. Reference was also made to the Institute's participation in the first of QQI's cyclical review periods, the CINNTE review cycle in April 2018. The outcomes of same was shared with the panel. The Institute's strategic objectives until 2022 were detailed for the panel.

Research metrics in relation to the bid for TU status

The panel explored further with the Head of Faculty and VP of Academic affairs how the TU metric in relation to research is going to be achieved. They were informed that a number of Masters Programmes are being reconfigured so that the ECTS allocation for the thesis component is 60% of the programmes total ECTS weighting. The theses are going to be primarily industry/ practice focused so industry gets added value from their employee/student undertaking a Master level programme and the student gains a series of research competencies and skills. The aforementioned reconfiguration of some Masters programmes will assist the Institute attain the 4% research student target that is required for consideration of an Institute of Technology for TU status. The faculty are planning to reconfigure 5 programmes. In order to achieve the research metric aligned to number of staff with a PhD or equivalent (45% of full time academic staff) the Governing Body have committed €1.7 million to assist in the growth of research which will be utilised to fund a number of initiatives to support academic staff such as funding for Doctoral studies, reduced teaching loads and protected time to write up dissertation etc.

Student numbers

The Institutes strategic plan KPI in relation to the growth in student numbers was discussed with clarification sought if a growth in student numbers would mean a corresponding expansion in programme offerings. The panel were informed the numbers would be realised both through the development of new programmes developed as a result of an

identified industry need and through the recruitment of more students to existing programmes. The expansion of the Institutes virtualisation capacity should attract more students to programmes which can capitalise on virtualisation.

Campus Facilities

The development of the campus facilities to accommodate the predicted growth in student numbers was discussed and in particular the range of new academic supports that have been instigated such as the Academic writing support centre, Maths support centre and CELT to support academics expand their range of delivery and assessment modes. The panel were also informed of English language supports for international students. An increase in students' services such as counselling, disability and healthcare professionals has also occurred. The capital investment in the IT infrastructure will realise more benefits to the student body such as the ability to engage with a range of software regardless of their place of residency. The aforementioned will reduced the need for some students to come on campus.

Internationalisation

Discussions on the Faculty's international links revealed that the faculty accommodate a number of student placements under the Erasmus Plus scheme but are challenged to get a significant cohort of their own student body to avail of Erasmus funding to support them to study outside Ireland. The Faculty anticipate that the introduction of work placements across all level 8 programmes may address the current reluctance to engage with Erasmus.

The Chairperson thanked the Head of Faculty and VP for academic affairs for their contribution.

Part 5 Meeting of Panel with Head of School, Heads of Department & Director of PEM

Ms Una Parsons, Dr David Mulligan, Ms Diane O Brien, Mr Emmet Doherty, Dr Xavier Velay, Mr Trevor Mc Sharry, Dr David Tormey.

A presentation (Appendix 4) by the Head of Faculty provided the panel with a detailed over view of the Faculty in terms of facilities, organisational structure, student/staff numbers, industrial linkages and research and innovation activities. The keys changes since the last programmatic review have been growth in student and staff numbers, new programme development, growth in online delivery, faculty restructuring, significant capital investment, expansion of international collaborations, growth in R & I activities (PEM technology, CREST and I Form Centre) and the introduction of a series of promotional activities such and Engineering & Technology EXPO/ Engineering fair. The panel were advised of the current Faculty plan and vision - "*A leading Faculty of creative innovative and technological education*- and mission which shaped the 6 objectives set for achievement in the next 5 years.

The research activity of the Faculty was shared in terms of their research centres activities, research student numbers, compliment of staff with PhDs or equivalent, number of staff predicated to gain a PhD in the next 5 years, graduate numbers, funding and research outputs in terms of publications/conference presentations.

The Panel expressed how impressed they were by the growth in student numbers since the last programmatic review and by the fact that 47% of students are online students. They also noted the concurrent 13% rise in staff numbers but appreciated that there was still a reliance on HPALs to assist with programme delivery. The Head of Faculty informed the panel that the Executive committee recognised same and have committed to the recruitment of additional staff for the coming academic year, 2019-2020.

The Head of Faculty was asked to detail the numbers of staff with PhDs and the numbers currently studying for a PhD. These details were shared and the panel informed that the recruitment initiative alluded to above should yield additional doctoral qualified academic staff which will contribute to the existing research profile of the faculty. The panel explored

with the team what was driving the expansion of research in the Faculty- the bid for TU status and/or industrial links which require the conduction of research. The team believed that as the majority of their research activity is applied with a focus on innovation with the link with industry being the strongest driver and the one that consistently needed to be responded to, in order to maintain good links with industry partners as they are also the source of ideas and students for new programmes. It was recognised that a conceptual definition of what constitutes research in relation to YAADA needs consideration so their outputs which may include a range of artefacts are recognised at Faculty/ Institute level.

Programme development in terms of rationale for, timelines and quality metrics were discussed between panel members and the team. The panel were satisfied with the response and appreciated that to adhere to all the required quality process that the timeline from idea inception to delivery is usually 12-18 months.

Gender Balance

The panel explored with the team what strategies were being deployed at Institute and Faculty level to address the current gender imbalance. The Institute's commitment is evident in their signing up to the Athena SWAN Charter and the impending self-assessment that will have to be conducted as part of the Bronze award application. At Faculty level where only 16% of the student population and 23% of the staff area female a number of strategies are in place such as flexible working arrangements, initiatives such as women in engineering coffee mornings, the establishment of an Engineering Fair aimed at school children to give them an appreciation of the diversity of engineering and female representation on school visits. The team expressed a need to target primary school girls as many girls rule out engineering as a career early in secondary school. The panel and team reflected on whether achieving gender balance was realistic but agreed enhancing the current imbalance was required.

Preparation for Programmatic validation process

The panel explored with the team how the Faculty, Departments and programme boards prepared for the programmatic validation. The process was detailed for the team and how the work conducted via working groups for the Faculty review contributed to the current

programmatic validation. Widespread engagement of staff in the process was reported with the communication channels open throughout. All feedback was considered and exemplars of best practice shared across the Faculty as were templates for writing modules/ assessment/ learning outcomes. The process was productive and informed the Faculty of their strengths and weaknesses.

Internationalisation

The panel discussed with the team how they proposed to meet the HEA international student target of 15% from their current base of 9%. The panel were informed the Institutes personnel support for internationalisation works with the Heads of Department in relation to potential international links and screening of applications. The Faculty's experience to date (e.g. Germany, China) was shared with the panel. The panel recognised that the development of robust international links took significant time but were pleased to hear of potential developments in the Asian market.

Work placements

The panel sought clarification on whether there was existing Faculty parameters in relation to duration of work placements, number of ECTS attached, developing work placements, managing the administration tasks associated with placements and scheduling of placements. Discussions revealed that there is a variance in practice with some departments having limited experience and others with significant experience of work placements. Challenges are encountered securing work placements for some programmes. An alternative assessment exists for students who are unable to secure a placement and/or cannot avail of the placement. In the absence of a central support resource for initiating and monitoring of work placements, the faculty is dependent on academics staff nurturing industrial links as a means of securing placements. It was acknowledged that the Strategic plans KPI of the inclusion of a work placement in all new level 8 programmes will be challenging but there was a concerted belief they are a very important component of any programme and an expectation of future employers. The panel asked the team to consider developing a Faculty work placement guide containing some agreed guiding principles.

Student numbers & retention

The panel discussed with the team the challenges of scaling up student numbers and programmes. The introduction of student advisors and instructional designers for online delivery has been a welcome institute initiative. The practice of sharing module across programmes and common semesters/ year 1 is proving an efficient and effective way of managing growing student and programme numbers and is resulting in a better teaching and learning environment for both academics and students. The need for additional space for project work was raised. This issue was considered particularly pertinent to the Department of Computing and Electronic Engineering. The manner in which the retention is tracked across the Faculty and is being dealt with was discussed. The supports alluded to earlier in the report such the Academic writing centre were raised by the team and considered vital to student retention. Other local modular initiatives are in place such as additional teaching hours for modules where there is a recognised issue.

Research

The Director of PEM gave an overview of the Institutes three research centres and of PEM in relation to type of research activity, staffing and outputs. The manner in which post graduate students are recruited and funded was detailed for the panel. The challenges recruiting post graduate student in the buoyant employment market was shared as was the need to increase the numbers of academic staff with doctoral qualification to expand research supervision capacity. The recruitment of a VP for Research & Engagement is building new links with potential research partners in the community. The strategies being deployed at Faculty level to augment the research culture such as introducing staff to R & I in a manner that is perceived as enhancing and respectful of their level of research expertise and industrial knowledge. Changing the predominant teaching culture of the Faculty is recognised as a long term objective which needs to be finely tuned so teaching expertise is not diminished as a consequence of the enhancement of research. There was discussions about psychometrically robust tools to assess staffs technological readiness level (TRL). The Head of Faculty furnished the chair with more specific details on research outputs post discussion (Appendix 4).

The chairperson thanked the team for their level of engagement and concluded the session.

Appendix 5 details the staff members who met the panel.

Part 6 Departmental Meetings

Department of Computing & Electronic Engineering

Panel Team:

Title	Name	Surname	Role	Institution/Company
Mr	Terry	Twomey	VP Academic Affairs & registrar (Chair)	Limerick Institute of Technology
Dr	Brendan	Ryan	Head of Department of Visual and Human Centred computing , School of Informatics and Creative Arts	Dundalk Institute of Technology
Mr	Keith	Moran	Managing Director, SL Controls	IDA Business park, Collooney, Sligo

The panel chair welcomed the Head of Department and their team and explored a number of topics with them namely;

Project management skill development

The panel explored with the team the strategies they employ to develop the project management skills of their student body which they can subsequently use as employees. The team were able to furnish the panel with a number of exemplars which are deployed during the development of their project.

The role of Programme Board in the programmatic revalidation process

The panel ascertained from the programme team how they prepared for the current validation process. The team shared with the panel that the Programme validation process was a standing agenda on all programme board meetings, working groups with specific foci were established, stakeholder feedback was acquired and analyses and Share Point was utilised to share developments between working teams; Head of Department and Head of Faculty.

Climate Action/ Sustainability

The panel explored with the team if they consider Climate Action/ Sustainability in the development of their programmes and the team informed the panel about their current use of CITRIX as a virtual platform and is aiming to develop Virtualisation further. In addition, the content of some modules addresses issues such as sustainable energy etc. The panel were satisfied with the team's responses. Some of the students' projects provide evidence of their appreciation of issues such as sustainability and climate change.

Ethics/ Professionalization

The panel were informed how ethics is introduced to the student cohorts and how they are challenged to consider ethical issues in their discipline. Ethics is an embedded in all modules in various formats.

Assessment Guideline development (Faculty to Department)

The manner in which assessment guidelines are developed at Faculty and Department level was explored with the team. The panel were informed of the existence of a teaching and learning group in the Department and the proviso that no learning outcomes can be assessed twice. The panel were informed that there was a general move to course assessments over exams as they are more conducive to assessing the learning outcomes of the modules.

Work placements

The manner in which work placements were arranged, the duration of work placements, the scheduling of work placements and the Department/Faculty administrative support for work placements and alternatives for work placements when not available were explored with the team. The need for a work placement officer or something similar was discussed. The need for a work placement officer or something similar was discussed. The advantage of work placements to academic supervisors was addressed. The panel felt that there needs to be some standardisation across the department in relation to work placements.

Apprenticeships/ Online delivery

The Department endeavours to secure computing apprenticeships has to date not being fruitful but the Department will continue to try and secure same. The Department endeavours to keep software/hardware costs manageable for online students was shared with the panel. The development in online programme delivery over the past 5 years were detailed including the supports that are now available to both academics and students such as Instructional designers/online student support officers. The decision to drop the requirement for online students to come to the campus two days per semester was explored and the potential ramifications of same for students in terms of networking and practice experience opportunities. The strategies to counteract any negative fallout from the aforementioned strategy were discussed. The added value to the full time student cohort of the presence of online delivery was detailed. The panel questioned the team on the hours allocated for preparation and support the online student body.

Student numbers

The declining numbers of full time students and increase in online students was discussed. The reasons for the falling numbers online extrapolated and the profile of the online students discussed

Internationalisation

The team shared with the panel their international links (Middle East; Germany, China) and plans to develop further.

Quality Assurance

The panel explored with the team the quality assurance structures within the Department with reference to the EAP7 and how the quality link was closed through the EAP 7.

Technological University Metrics

The panel teased out with the Department how staff are being supported to complete their doctoral studies. The initiatives offered by the Institute to support academic staff were explained to the panel as were the challenges undertaking doctoral studies with a high teaching load. The rationale behind the introduction of the structured Masters programmes in terms of increasing research student numbers was discussed with the team.

Athena Swan Charter

The panel teased out with the Department how Gender imbalance issues are being addressed if the online space having a positive impact on same. The strategies that the Department and faculty are implementing to increase non-male applicants were shared with the team.

Retention Levels

Strategies such as peer mentoring, maths and academic writing centres, increased support at programme level have all been introduced to assist with the retention of students. The initial weeks of year 1 are particularly problematic. The Department have recognised that years 2, 3 & 4 also need to be monitored and are introducing workshops and team events early in the new academic year to address any emergent retention issues in the aforementioned years.] The team recognise the important of developing a sense of community in the Institute that student's feel they are part of.

Programme validation

The panel recognised that the majority of the programmes had been validated in the academic year 2017-18. The required recommendations have been responded to and no changes have occurred to these programmes in the interval. The rationale for their inclusion in this programmatic revalidation process was to have all programmes in the department would be on the same validation schedule. The only programmes that had some modifications and required revalidation according to the 5 year rule are as follows.

SG_KCMPT_L08 Higher Diploma in Computing (Software) Full Time & Part Time
SG_EAUTM_N06 Cert in Electronics and Automation
SG_EELCO_B07 BEng Electronics and Computer Engineering (including the following embedded programmes)
SG_EELCO_B06 Higher Certificate in Electronics and Computer Engineering
SG_ETRON_J07 BEng Electronic and Computer Engineering (Full Time and Part Time (aka online))
SG_ETRON_K08 BEng (Hons) Electronic and Computer Engineering (Add on)

The panel had an engaging discussion with the Department team in relation to the following programmes.

SG_EAUTM_N06 Certificate in Engineering in Automation & Electronics

Clarification was sought on the title. The panel explored the modules that were shared with other programmes and the how this programme serves as a qualifier for other level 7 programmes. An issue with how the programme students was recorded in module manger was addressed.

Bachelor of Engineering in Electronic and Computer Engineering (Ab-initio).

The programme team confirmed that this programme shares a common first year with all other engineering programmes. The panel queried the apparent drop in progression rates in the past academic year. The team explained that the dilution of the programmes and thus the smaller student numbers per programme magnifies any attrition.

Bachelor of Engineering (Honours) in Electronic & Computer Engineering

The Panel complimented the team on introducing AI to the programme and explored the content of same with team members. The panel queried with the programme team the use

of Microsoft technology such as One Drive and Share-point to prepare the students for working in a global work environment. The team explained the extent of it use in the programme.

SG_KCMPT_L08 Higher Diploma in Computing (Software) Full Time & Part Time

The panel noted significant changes to this programme notably the reduction in ECTS from 90-70. Clarification was sought from the Programme team the rationale for such a change are were satisfied with the response received. The issue of remote proctoring was explored and the perceived efficacy of same. The panel explored with the team their use of virtualisation.

Bachelor of Arts (Honours) in Computing in Application Design and User Experience (Ab-initio)

This programme is undergoing no changes. The team shared with the panel the success of year 1.

Bachelor of Science (Honours) in Computing in Smart Technologies

The programme team shared with the panel the low uptake of this programme and their plans not to deliver year 2 of the programme. The existing three students will transfer to another programme. The team believe that the programme maybe ahead of the curve and that believe that it will be an attractive offering in the future. The programme will therefore remain on the C.A.O.

Bachelor of Science (Honours) in Computing in Computer Networks and Cloud Infrastructure (Ab-initio)

This programme shares a common first year with other programmes and this is working well.

Bachelor of Science (Honours) in Computing in Software Development

The team shared with the panel that this is a long running programme that always attracts students.

Bachelor of Science (Honours) in Computing

This programme was introduced 4 years ago and affords students more time before they are required to specialise which is attractive to students.

Bachelor of Science in Computing in Games Development

The only modification since its inception is the addition of an exit award at year 2.

Certificate in Secure IT in Deep Machine learning.

The panel explored the origins of this programme and the varied student profile. The first year of the programme has been delivered successfully.

Masters of Engineering in Connected and Autonomous Vehicles

The German background to this programme was discussed with the Programme team. The significant staffing input this programme takes was also discussed

This concluded the panel discussions with the Department staff.

Department of Mechatronic Engineering

Panel team:

Title	Name	Surname	Role	Institution/Company
Dr	Mark	Clarke	Lecturer (Chair)	Dundalk Institute of Technology
Dr	Alan	Ryan	Lecturer in Sustainable Automation, Quality Management & Supply Chain	University of Limerick
Mr	Laurent	Palasz	NPPI Manager	LINDAL Group, Finisklin Business Park, Sligo

Discussion with Head of Department & academic team

Online programme delivery

The panel commended the team for their programmes online presence and discussed with the team how they identify the particular topic niche and the potential market. The team shared with the panel exemplars of how certain industrial sectors (e.g. Google) had approached them for particular programmes and how their ongoing links with other industries assists in the identification of particular areas for development.

Developing & maintaining community of learners in the online space.

The programme team detailed to the panel how they develop and nurture a community of learners through the provision of an onsite programme inductions, on site workshops twice a semester, the deployment of online discussion groups, e-mail, tutorials and the allocation of a programme lead to coordinate the programmes. The team shared with the panel their experience of online students' willingness to support fellow learners and that peer support is very evident among online student.

Student experience

The programme outcomes are the same regardless of mode of delivery. The student profiles are different with online students attracting mature students who are in employment so as a result they have the opportunity to apply theory to practice or can appreciate its application more than the cohort of full time students who tend to be younger and without industry experience. Online students are more inquisitive and expect to attain a deeper

learning than the full time student cohort. Online students also tend to be more motivated as the choice to pursue an educational programme has usually being given more consideration. This usually results in better retention and success rates.

Retention

It was acknowledged that it was more challenging to maintain accurate retention records for the online student cohorts as a proportion of them seek deferrals at different stage of the programme and take longer to complete. Deferral are usually sought for competing family and work commitments. Retention issues usually emerge in year 1 in the full time student cohort. The team acknowledge that there is a responsibility on them to ensure that students opting to do a level 7/8 programme have the capacity to do so and therefore their previous academic qualifications needs to be considered carefully and/or if RPL is being deployed it needs to be done so forensically. The specifics of the RPL process were detailed for the panel.

Project management skills

The panel sought clarification from the team on the practical transferable skills that the students acquire as a result of the project focused modules. The panel were assured that the students gain many transferable project management skills as a result of the project requirements (e.g. inclusion of risk assessment, Gantt charts), work based projects focus and allocation of marks for components such as planning and communication. All projects have 3 elements, namely data acquisition, control element and visual interface. The academic staff gain assurance that the project work is the students own through a variety of means, students present and demonstrate projects and academics can also make visits to the student's place of employment to evaluate the project. Students can utilise the appeal system if they feel this is warranted.

Ethics as it relates to engineering practice

The panel sought clarification that ethics was an integral part of their suite of programmes as there is no standalone module on ethics. The team were able to assure the panel that the practice of ethics was threaded through a number of modules and the students are made very familiar with engineers' societal responsibilities. Modules have been introduced which

address sustainability, recycling and renewable energy sources. The panel advised the team to make the latter more visible in their curricula.

Student profile & feedback

Clarification was sought around the breakdown of student numbers per mode of delivery and the rationale for presenting them together in some cases was sought. The panel queried why the student numbers on Level 6 & 7 programmes are growing but those on level 8 are static. The panel were informed that the reason for same was due to insufficient facilities and staffing but that funding has been received to enhance laboratory facilities so it will be feasible to expand the numbers on the Level 8 programme. The higher success rate for online students is perceived to be as a result of their prior and current work experience. Student feedback is sought and feeds into Programme boards and is acted upon if required.

Employer feedback & industrial research links

A number of informal and formal strategies are used to seek employers' feedback to enhance programme content and focus. For example, the Data centres have an annual steering group meeting and the ENG Expo includes a breakfast morning meeting with industry groups where the department present to them and then a series of discussions are held to garner feedback.

The panel explored with the team the avaibility of opportunities to engage with industry from a research perspective. The team shared with the panel examples of current engagement in the area of Control system design for polymers. The departments strive to increase students on Level 8 programmes will also create a potential pool of graduates who may engage with research at level 9 and 10.

Programme development

The panel teased out with the team the programme planning process and advised that it is prudent to put in place all of the necessary resources (physical/ personnel etc.) prior to student recruitment. Examples of new programmes planned and the availability of resources was explored further. The Head of Department explained to the panel the planning process that is required before the executive agree a programme can be developed. The panel considered that as an Institute that capacity planning must be

proactive so that opportunities alluded to above which are preventing the growth of level 8 numbers do not occur.

Title change

The panel explored with the team if the title Mechatronics was fit for purpose and understood by applicants. The team shared with the panel the results of the surveys they have conducted on this issue which provided no evidence that the title should be revised at this juncture.

Gender balance

The team were asked to advise the panel of the strategies they had instigated to enhance the non-male cohort of students of on their programmes. The team furnished the panel with a number of examples such as school visits, general entry route and plans to develop a Biomedical Engineering stream with the Faculty of Science

Trades and apprenticeships

The need for a person to manage/lead the Trades and Apprenticeships is becoming increasingly evident as they grow in number. These programmes have different funding, legal, academic processes and calendars than other academic programmes and therefore require a person to take the lead on same.

Mechatronic suite of programmes

SG_EGENE_X06	**Higher Certificate in General Engineering**
SG_EMTRN_C06	**Higher Certificate in Mechatronic Engineering**
SG_EMTRN_B07	**Bachelor of Engineering in Mechatronics (Ab-initio)**
SG_EAUTI_N06	**Certificate in Engineering in Automation and Instrumentation**

SG_EMTRN_J07	**Bachelor of Engineering in Mechatronics (Add-on)**
As above	**Bachelor of Engineering (Honours) in Mechatronics (Add-on)**
SG_EMTRN_K08	**Bachelor of Engineering (Honours) in Mechatronics (Add-on)**

The Head of Department provided the panel with an overview of the mechatronic programmes. The sharing of modules with other engineering programmes was detailed and the perceived benefits of same detailed. The 4 streams within the mechatronic programmes are

- Networking stream
- Auto Programming built around Semins PLCs
- Robotics Stream
- Control stream

The panel complimented the team on the introduction of a common first year but wished to know how they managed expectations in relation to year 2 preferences. The team explained how this was managed in a very objective manner which the students had prior knowledge of. The entry points of the students and the impact this had on retention and completion rates was discussed with the Head of Department sharing the findings of analysis that he had conducted which indicated that students with 250 points or less are unlikely to progress successfully through the programme. The team shared that a number of supports had been put in place to address topics like Maths that students struggle with and they have had a positive impact on progression rates in these subjects. Issues such as: laboratory attendance expectations, project selection, project expectations and support were all explored with the team. The panel sought clarification from the team on how analogue electronics and digital electronics were dealt with in the programme as it was not evident from the programme/ module descriptors. The team provided the team with further information in relation to the control systems module, machine learning, rationale for the deployment of SEMINS PLCs and their usage. The panel were satisfied with the response received. The panel discussed how work placements were managed at the department level. The panel explored with the team what the employment focus of the graduate from the level 7 programmes was and were informed that it was maintenance and design of routine systems. It is hoped that the introduction to design would entice the level 7 graduates to return and study at level 8 which has more in-depth design focus.

Data Centre programme

SG_EDATA_J07	**Bachelor of Engineering in Data Centre Facilities Engineering (Add-on)**

The panel were informed about the origins of the programme, the content selection process, the delivery of the programme, the international linkages and the potential programme target/audience. The programme is perceived as demanding by students as they are all in employment and this has meant deferrals are often sought. To develop the programme further additional academic staff are required, laboratories and equipment.

Polymer suite of programmes.

SG_EPOLY_E06	**Certificate in Polymer Technologies**
SG_EPLYP_J07	**Bachelor of Engineering in Polymer Processing (Add-on)**
SG_ENEWN_K08	**Bachelor of Engineering (Honours) in Polymer Processing (Online)**

The Head of Department provided the panel with an overview of the programme, the origins, the development process, the need/demand for this programme, the delivery route and student profile. The panel queried with the team the software applications (MINITAB) being deployed and the extent of their deployment in the various programmes. Project selection, preparation and support was detailed for the panel. The panel queried with the team why robotics was not an integral part of the programme content. A discussion ensued about the importance of the use of robotics within the polymer process and the need for students to understand this and the use of robotics as opposed to the design. There was agreement that the need for robotics is not required in terms of technical competence and programming, however an appreciation of the limitations of and the use of robotics in the polymer processing would be of benefit and can be achieved with company visits and a lecture topic in some of the modules. The team appreciated the discussion and would consider its inclusion, potentially in the Precision Engineering. The team were also asked to defend the inclusion of two control modules (Control 301 & 302). The use of *Euromapping* as an interface was also discussed as was 3D printing. The panel teased out with the team the differences in the quality modules between level 7 and level 8 programmes as on the face of it there appears to be duplication of content. The team detailed for the panel the

discernible differences between what is delivered on level 7 & 8 with the content on the level 8 programmes being Level 8 is based on best practice in industry and the content is more analytical with the application of quality process to the improvement of polymer processes an integral part of the students projects. Other content issues such as experimental design, project support and material regulation were explored with the team to the satisfaction of the panel.

This concluded the panel discussions with the Department staff.

Department of Mechanical & Manufacturing Engineering

Panel Team:

Title	Name	Surname	Role	Institution/Company
Dr	Olivia	Mc Dermott	Lecturer (Chair)	Management Development Unit, University of Limerick (Tuesday only)
Ms	Maria	Kyne	Dean of Faculty (Chair)	Faculty of applied Science, Engineering & Technology LIT (Wednesday only)
Mr	Bernard	Murray	Panel Member	Engineering Operations Manager, Abbvie
Ms	Aoife	Deasy	Student Representative	USI

Meeting with Head of Department and Academic Staff on Tuesday May 7th.

Quality Suite of programmes

SG_EWORK_S06	**Certificate Work Based Project (SPA)**
SG_EQUAL_E06	**Certificate in Quality Assurance**
SG_EVALI_S06	**SPA in Validation Technologies**
SG_EMANM_J07	**Bachelor of Science in Manufacturing Management (Add-on)**
SG_SQUAL_J07	**Bachelor of Science in Quality Engineering (Add-on)**
SG_ESSYB_E07	**Certificate in Six Sigma Yellow Belt**
SG_ELSIG_S07	**SPA Certificate in Engineering in Lean Sigma Quality**
SG_EADVA_E08	**Certificate in Advanced Lean Sigma Quality - Black Belt**
SG_ELEAN_E08	**Certificate in Advanced Lean Sigma Quality Project - Black Belt**
SG_EQUAL_K08	**Bachelor of Science (Honours) in Quality Management & Technology (Add-on)**
SG_EQLTY_M09	**Master of Science in Quality**

Dr John O'Donovan gave brief overview of all programmes, 9 in total from level 6 to level 9. Typically students are in the work place. JD listed all programmes. In preparation for

Programmatic Review, current students and graduates were surveyed, resulting in positive responses.

MSc in Quality Level 9-some concern around Project management module and assessment style, too much group work, springboard students tend to drop out, early drop outs which can create problems for groups

BSc in Quality Management & Technology, level 8-Noeleen Grant gave overview of survey responses -positive feedback from surveys, flexible learning and delivery of modules. Feedback that project warranted higher credits.

Inspection measurement and testing-thought to be duplication of level 7 module, also Case Studies which was created with full time students in mind.

BSc in Quality, Level 7 – Paul Curran summarised feedback from surveys, very positive responses.

Production Management to be introduced following feedback.

Level 7 BSc in Manufacturing Management-Caroline Mullan summarised feedback from surveys. Green belt project proving very popular

SPAs-yellow belt and green belt-industry recognised award

Feedback-many companies doing Lean now-Lean yellow belt now added , simulated six sigma added in

Following GDPR law-surveying students and graduates could be problematic in the future.

Report from IBEC used as checklist for programmes-are all quality areas covered? Yes

Chair queried introduction of online advisors? Positive move, assisting with non-academic queries from students etc. When programmes moved online, many academics took over admin roles.

Feedback-Chair agreed that feedback was most relevant as survey responses are from students/graduates currently working in industry.

Programmes/modules changed to reflect feedback from surveys

Master of Science in Quality (SQ_EQLTY_M09)

No new modules are proposed for the MSc in Quality. All modules have had their booklists updated to reflect more modern textbooks. There have also been some minor changes in the indicative syllabi to reflect more modern trends and techniques.

Bachelor of Science (Honours) in Quality Management and Technology (Add-on) (SG_EQLTY_K08)

Feedback that project warranted higher credits, increased it to 10 credits from 5. Students will be able to do a 10 credit Six Sigma industrial based project or a literature review with linked work based practical of 5 credits each.

Inspection measurement and testing has been removed from the Programme. Case studies will be replaced with Service Quality. Updated all other modules to reflect industry needs

Certificate in Advanced Lean Sigma Quality - Black Belt (SG_EADVA_E08)

All modules have had their booklists updated to reflect more modern textbooks. There have also been some minor changes in the indicative syllabi to reflect more modern trends and techniques.

Certificate in Advanced Lean Sigma Quality - Black Belt (Project) (SG_ELEAN_E08)

There are no major changes to the programme.

Bachelor of Science in Quality (Add-on) (SG_SQUAL_J07)

All modules have been considered, reviewed and updated by the Course Board. This has resulted in minor modifications and updates to all modules. In addition, the module 'Service Quality' has been replaced with 'Production Management' as it was considered more directly relevant to the skillsets required by our students. Many of the modules have been using a computer based assessment methodology (WIRIS), which individualises questions, automatically corrects the questions and gives detailed feedback to the student that is directly related to the question given. This approach has been piloted in the modules:
Mathematics and Statistics, Six Sigma 2, Project Management, Management Accounting and AppliedStatistical Improvement. Although still a pilot, this assessment methodology has received overwhelmingly positive feedback from students.
The new module is 'Production Management' (MGMT07040).

Description: Production Management involves managing the resources required to produce goods and services. This module will focus on the decisions involved in the planning and control of a manufacturing operation.

Certificate in Six Sigma Green Belt (SG_ESSYB_E07)

The following are proposed changes to the programme. None of the changes affect the learning outcomes of the programme. A summary of the changes is as follows:

• Simulated Six Sigma Project Option: While we strongly encourage all students where possible to complete a live Lean Six Sigma project in a workplace environment, not all students are in a position to do this. If a student is not in a position to complete a Six Sigma project with an employer, then an alternative project is provided. This traditionally has been a research project with the student undertaking a literature review. Feedback from students is that it did not allow them to put the Lean Six Sigma tools into practice. To address this, a new simulated project option is being added to the Project module on the programme. This will replace the research project.

• Lean & Operational Excellence module (Yellow Belt)

There have been a number of award winners of the internationally recognised Shingo Operational Excellence (OpEx) prize in Ireland and this is increasing awareness of the Lean tools to drive operational excellence. The Shingo Prize is based on a complete assessment of an organisation's culture and how well it drives world-class results. Several industry partners have recently asked IT Sligo to provide a Lean (Yellow Belt) module dedicated to the Lean tools as opposed to the Six Sigma tools. After undertaking the IT Sligo MOOC, Glanbia approached IT Sligo to deliver a Lean Yellow Belt module with a greater focus on Lean and OpEx. This module is currently being delivered to Glanbia as part of their national rollout of Lean/OpEx training across a number of their sites in Cavan, Monaghan and Kilkenny. To support this rollout, we have also delivered a number of Lean workshops onsite to Glanbia staff. The programme team now propose to add this module as an elective on the Certificate in Lean Sigma Quality. The team are also in discussion with other large employers who are interested in having their employees take this module.

Bachelor of Science in Manufacturing Management (Add-on) SG_EMANM_J07

Contemporary Management will be replaced with Occupational Safety & Health module

Level 6 Special Purpose Award in Quality Assurance SG_EQUAL_E06

The Supervisory Management module will be renamed as "Fundamentals of Management" as it is believed that this is more reflective of module content. This will not impact on the learning outcomes of the module or programme. There are no other changes suggested for the programme as it is running well. There is an option to complete a further 30 credits in one year by completing the L6 work based project and this is indicated on the course description page which has been updated to clarify progression requirements to L7.

Level 6 Special Purpose Award in Validation Technologies SG_EVALI_S06

The only proposed change to this programme is to slightly reduce the content of the Regulatory Affairs module and to make it more Pharmaceutical based, rather than medical device based. The number of continuous assessments will be reduced by one. The changes will not affect the module learning outcomes or the programme learning outcomes. There is an option to complete a further 30 credits in one year by completing the L6 work based project and this is indicated on the course description page which has been updated to clarify progression requirements to L7.

Level 6 Certificate in Work Based Project SG_EWORK_S06

The programme is relatively new and therefore there are no changes.

Operational issues related to above programme changes:

The chair explored with the team if there was sufficient resources in place to address operational changes. The Head of Department HOD informed the panel that many HPALS are currently employed and staff overtime is used to address current resource requirements. However, new academic staff are being recruited.

The panel queried the PhD percentage for Department to meet TU status. The Head of Department informed the panel of the current status of persons with a doctoral qualification within the department. Chair advised Department not to lose student and teaching focus in drive to reach PhD numbers.

Programme board recent changes

1. WIRIS-simulation package introduced-helps students in statistical analysis, can be used for self-assessment by students. This can be used as part of CA by lecturers also. This has proven beneficial for students.
2. ALEKS-maths application currently used for yr1 engineering maths to help students improve maths ability.
3. Online advisor for Quality programmes recently recruited.
4. West/NW Lean Network group set up with many companies, about 130 members. Site visits for students proving very popular.
5. Internationalisation-online programmes-online proctoring - need for robust proctoring system. Has an impact on the international student recruitment and assessment of students. Issues around online proctoring needs to be addressed

<u>Mechanical Engineering suite of programmes</u>

Higher Certificate in Engineering in Mechanical Engineering (SG_EMECH_C06)

Bachelor of Engineering in Mechanical Engineering (Ab-initio) (SG_EMECH_B07)

Bachelor of Engineering (Honours) in Mechanical Engineering (Add-on) (SG_EMECH_K08)

Head of Department gave brief overview of the programmes. The following topics were discussed in relation to the Mechanical Engineering Suite of Programmes:

1. Common first year to be offered across a number of engineering programmes in the Faculty. This common yr1 caused reorganisation of modules across all years of the mechanical & precision engineering and design programmes
2. CAO entry – The Chair noted the increase in CAO points in recent years.
3. Transfer and progression from Level 6 on to level 7 programmes needs to be included/identified on Module manager.
4. Contact Hours-The Chair queried the high contact hours. The Department staff have followed the guidelines from IT Sligo.
5. Failed elements identified on the approved programme schedules on module manager. The Chair queried the appropriateness of the use of failed elements on

these programmes. Breakdown between CA and Theory-students can be stronger in CA but less focused in theory section.

6. Failed element in yr1-Industrial Automation? Shouldn't be failed element
7. CIM & Auto-shouldn't be failed element- mistake on Module Manager
8. Design & Project- mistake on Module Manager -overall combined mark should carry
9. Any feedback from students on common yr1? Students appear to welcome common yr1, not always sure of choices in CAO. School visits feedback-not sure of which Engineering stream to apply to-common year 1 would address this.
10. Pass rate appears low, particularly in yr4. The level 7 students are not prepared for level 8. This will be addressed in the new level 8 ab initio programme which will include a work placement period. Some modules have been decoupled to help student pass rate, this should improve the pass rate.
11. Very few 10 credit modules. Typically 'Project' is the only 10 credit module
12. Repeat assessment strategy - Wording used on Module Manager. This should be clarified as there are some good examples, but some others are very loose and open to various interpretations. The mechanism that the student should use to repeat the module should be included here (exam, coursework, etc.).
13. Twenty three contact hours on yr4 seems high. HOD replied that this has been the tradition in this Department.
14. Integrated project 9 hours per week was queried. This should be 7 hours on Module Manager. Mechanical programme strength is in the 'Project' area.
15. CAO points have been increased and could lead to a reduction in student numbers. HOD- plans to offer Ab Initio level 8 in the future.
16. Year 4-Fluids graded pass/fail. Should this be numeric? Typo-needs to be corrected in Module Manager
17. The manner in which work placements are managed for Precision programmes currently. For Mechanical programmes, it is envisaged that the work placement will run from January to September of year 3 in the ab initio programme. Response from industry indicates that longer work placement is preferred (at least 6 months). The assessment process for Work Placement was detailed. The Head of Department informed the panel that there will be a need for additional resources/support for the roll out of work placement.

Proposed changes to programmes

Bachelor of Engineering in Mechanical Engineering (Ab-initio) (SG_EMECH_B07)

The Mechanical Engineering Level 7 programme has seen many changes over the last 5 years. These include common first semester, decoupling of mixed modules, acceptance of the CDIO approach, and addition of important modules such as control systems. The common first semester was suggested based on feedback from those visiting secondary schools. Students know they want to do some kind of engineering, but do not know which. Other third level colleges offer un-denominated or common entry engineering courses, which after a period of time the student chooses which branch of engineering to follow. This option was not in IT Sligo until this programmatic review. In light of there being only six semesters for a Level 7 degree, it was decided to offer a common first semester, along with a General Engineering entry. Other modules such as 2nd year mechanics had been recognised as being difficult, and it was felt that this should remain running all year long, but this could only be achieved by allocating 5 credits in both semesters. In this review, it was decided to semesterise 2nd year mechanics, which freed up 5 credits, which allowed for Thermodynamics & Fluid Mechanics to be run in year 2. New modules have been added to the programme, for example *Thermodynamics & Fluid Mechanics* have been added to year 2, *Control Systems* has been added to year 3. One of our lecturers is trained in CDIO for engineering students and organised a training session for the engineering faculty. It was seen to be an attractive option and has been added to semesters 2, 3, and 4.

Bachelor of Engineering (Honours) in Mechanical Engineering (Add-on) (SG_EMECH_K08)

In the last programmatic review, all courses were obliged to semesterise, many felt this was the wrong way to go. Some modules were coupled together, e.g. Mechanics and Dynamics 401 / 402, in the last programmatic review so that students still got the long thin immersion into a module. For various reasons this did not work. Students were being over-assessed, students would fail one section and pass the other, students recognised that it was effectively two modules when there was the same allocation for one module, students had two different lecturers for the module. It was decided to decouple many of these in the

current programmatic review following a trial running mechanics in one semester and dynamics in the other semester.

Precision Engineering and Design Suite of Programmes

Bachelor of Engineering in Precision Engineering & Design (Add-on) (Online) (SG_EPREC_J07)

Bachelor of Engineering in Precision Engineering & Design (Ab-initio) (SG_EPREC_B07)

Bachelor of Engineering (Honours) in Precision Engineering & Design (Add-on) (SG_EPREC_K08)

Higher Certificate in Engineering in Precision Engineering & Design (SG_EPREC_C06)

M Moffatt gave brief overview of these programmes. The following topics were discussed in relation to the Precision Engineering and Design suite of programmes:

1. Not intended to offer the Higher Certificate in the future as the Higher Certificate in Mechanical Engineering is suitable.
2. Low student numbers-commonality with Mechanical makes the programme viable.
3. Online precision-level 7-entry requirement of level 6 (or holders of craft qualifications/RPL)
4. Failed elements-needs to be corrected on Module manager as per the commentary under the Mechanical heading
5. Contact hours-may need to be reconsidered in year 3
6. Pass rates were not mentioned in documentation. The pass rates varied from excellent with all students passing to some classes where 60% passed.
7. The Work placement module has many learning outcomes. Is it possible to measure all the learning outcomes? MMoffatt replied-each student writes report to cover all areas, if LO can be measured/offered by individual company. There is an alternative in place if the achievement of a learning outcomes is problematic for a student on work placement.
8. Failed elements are given on approved programme schedules for all stages of the programmes. For stage 3, Work placement 1&2-needs to be corrected on Module manager and on Valuations and Six Sigma 2
9. Entry transfer and progression needs to be visible on Module manager

10. Did extra tutorials for students improve the pass rates? Students take tutorials voluntarily so this is uncertain
11. Maths e-learning software ALEKS has been piloted and is proving positive. Yr2 mechanics and maths tutorials replaced labs which appears to have helped pass rates
12. Level 7 online programme, Semester 6. 12 hours given to project with 10 of those to design project work. This needs to be reconsidered and updated on module manager

The proposed modules for the online programme were not given to the panel prior to the visit but they were added to the documentation during the site visit.

Bachelor of Engineering in Precision Engineering & Design (Ab-initio) (SG_EPREC_B07)

The Higher Certificate in Precision Engineering & Design will be discontinued due to the implementation of the common first two years with both the BEng in Mechanical and Precision. Before the end of their second year, students will be allowed to stay on their programme of choice, or swap programmes if they choose to. Students will also be allowed to exit with a Higher Certificate in Mechanical Engineering.

Bachelor of Engineering in Precision Engineering & Design (Ab-initio) (SG_EPREC_B07)

Change Work Placement 1 & Six Sigma 2 (25 credits) + Validation (5 credits) to Work Placement 1 (20 credits) + Validation & Six Sigma 2 (10 credits)

Change Work Placement 2 & Six Sigma 3 (25 credits) + Metrology (5 credits) to Work Placement 2 (20 credits) + Metrology & Six Sigma 3 Project (10 credits)

Bachelor of Engineering in Precision Engineering & Design (Add-on) (Online) (SG_EPREC_J07)

All changes to the programme reflect changes in the equivalent fulltime B.Eng. in Precision Engineering & Design. In some cases, these changes are to make the module name more closely match the content. It is proposed that some of the current modules will be shared with other full-time programmes, such as Metrology and Materials Testing. There is no significant modification to the content and learning outcomes in this case.

Machine Tool and Product Design is being replaced with Computer Aided Design 301.

Mechanics and Mathematics 301 and 302 will be presented as two separate modules of Mathematics and Mechanics. The Mathematics portion will run year long, and the Mechanics portion will be replaced by a single 5-credit module called Mechanics & Dynamics 301.

Two related modules; Automation and Integrated Manufacturing 301, and Robotics and Integrated Manufacturing 302, are being replaced by a single module called CIM 301 (Mechanical). A new module called Machine Design is to be added. This is being added to the full-time programme, as it is material that is particularly important for the integrated project module. Quality Tools & Validation is being replaced by Lean Six Sigma & Validation.

Certificate in Engineering in Mechanical Analysis & Automation (Online) (SG_EMECH_S06)

C Doran gave a brief overview of the programme. A typical student has a craft qualification or industry experience.

The following topics were discussed in relation to this special purpose award:

1. Survey responses suggested that the 5 credits awarded to Maths did not reflect the student effort/workload
2. This programme acts as a bridging course for level 7 applicants with industry experience/craft qualification
3. Contact hours were queried as the documentation had many inconsistencies. Needs correction particularly on the Approved Programme Schedule

The first year of operation of the programme has identified some weak points as seen the staff and student feedback. This means that some changes to the programme are appropriate. These changes will align the work effort and credits received in mathematics and the need for CAD skills. They will also align the programme with special purpose awards also offered within the Faculty in Mechatronics. As a result of our experience with students and that they differ from the traditional cohort, the module CIM and Automation Technology Mechatronics 201 and CIM and Automation Technology Mechatronics 202 modules are being updated. These modules are being redesigned for online delivery only and are delivered to a number of online Special Purpose Award programmes.

The programme has a single 5-credit mathematics module in the first semester. Following staff and student feedback, and to remain aligned with other similar special purpose awards

in the Faculty, this will be changed to include an additional 5-credit mathematics module in the second semester. This will not involve increasing the work effort required, but rather increase the number of credits to reflect the work effort. Given the importance of CAD skills to the Level 7 degree in Precision Engineering and Design, it has been decided to add a 5-credit module to the programme, for the reasons outlined earlier.

General discussion issues.

Concerns around Work placement being offered Faculty wide were noted. A consistent approach should be implemented for all programmes

Offering Level 7 programmes on CAO shouldn't be underestimated, despite current interest in level 8 CAO offerings. However, Chair proposed that level 8 Ab Initio offering at CAO could assist with the viability of the level 7 programmes

High contact hours for projects are reflected in the quality of student projects and their success in National competitions.

This concluded the panel discussions with the Department staff.

Department of Arts, Design and Architecture

Panel team:

Title	Name	Surname	Role	Institution/Company
Dr	Adam	DeEyto	Head of School of Design (Chair)	University of Limerick
Ms	Nollaig	Crombie	Head of Department for Design & Creative Media	Letterkenny Institute of Technology
Mr	Jim	Culleton	Artistic Director.	Fishamble Theatre Company, Dublin 1
Mr	James	Hamilton	Architect	James Hamilton Architect, Belfast

Panel and staff team discussion on YAADA

Student issues/numbers

Q: Low numbers in YAADA courses are a concern. What is being done to address this?

A: The new facilities will be marketed under the guidance of the new head of marketing on campus

Q: Is gap year common to all programmes?

A: No, but this is something that is currently being looked at along with increasing course flexibility for students

Q: If the intention is to double student numbers how is this going to be dealt with in Staff numbers?

A: The levels of uncertainty in student numbers mean that HPAL difficult to manage staff numbers

Q: How do staff deal with students with specific needs: Mental health etc. as this can be a concern, particularly in arts and design courses?

A: It is a concern and staff do their best to deal with it but ultimately are not qualified to deal with such things and must refer student to the Student Counselling service.

Dissertations

Note: Department commended on proposal for Masters Programmes.

Q: Are the students able to deal with Critique (as opposed to criticism). Is there a policy or a way of approaching critique? How are they brought through the process?

Q: Do you have dissertations on all programmes?

A: Yes . The standard of the dissertations was unclear, they ranged from 6,000 to 12,000 in word count and in some cases include a practical or design element. This is somewhat consistent with YAADA's desire for research to be defined with broader parameters in order to recognise the approaches other than the written word.

- Some students struggle with dissertation.
- The academic writing workshops are a very welcome addition to the Institute

Student skills & integration

Note: All students need commonality of soft transferable skills. There is a great resource pool of these within the department that can be drawn upon.

Q: How is cross pollination of courses within YAADA currently addressed?

A: Through common first year entry courses.

Q: How linked is the department with community projects?

A: The department has close links with various creative enterprises around the region and regularly holds exhibitions, showcases and performances. There is also much work done in engaging with Primary and Second level education in the area. The department also undertakes awareness and fund raising campaigns

Research & innovation:

Q: How is research and innovation progressing?

A: R & I policy doesn't stretch to Arts' Design and Architecture in less traditionally academic ways in comparison with The Research Excellence Framework (REF) in the UK.

- Look towards practice based PhDs
- Practice and design based work should be included in research definitions
- Writing and Literature needs writers not "academics"

Note: There is a desire to establish a YAADA Journal.

- Balance between research and practice is essential
- Technical support for research projects is essential

Operational Plans & Proposals for the Future:

- Further internal collaboration between programmes
    - Furthering staff and student collaboration between programmes
    - Harmonization
    - Connectivity
    - Community
    - Shared space
- Continue to work on improving the Creative Showcase (We surprised ourselves last year with the quality of work)
- Internal Exhibition space (with an awareness of students potentially feeling vulnerable about presenting work within the institute)
- YAADA must work to foreground itself as a cultural force of the region
- Discussion needs to happen over whether or not exhibitions need to be curated

Stakeholder feedback

Q: What kind of feedback informs the progression of the Department?

- External examiner feedback
- Student Surveys
- Processes already in place provide internal feedback i.e. focus groups, standardised meetings
- Societal feedback on exhibitions and performances
- Industry surveys and discursive feedback about industry movements
    - It was noted that industry feedback should ought not to lead educational direction
    - The conversation re. direction of education should explore many different complexities

Note: External feedback and student feedback are very aligned

Programme review

Bachelor of Arts in Interior Architecture & Design (Ab-initio) SG_VINTE_B07

Bachelor of Architecture (Honours) (Ab-initio) SG_VARCH_H08

Note: Bachelor in Architectural Design being phased out. Bachelor in Architecture coming in.

Note: IT Sligo has the only Architecture programme serving the North West.

- Only 2% come back to Sligo after having left.
- IT Sligo Architecture courses pioneered different entry methods into architectural courses

Q: How many external examiners do architecture programmes have?

A: 2: 1 academic and 1 practitioner

Q: How do the external examiners engage with the process?

A: In Architecture, 2 Externs engage 3 times per year to assess the quality of work produced on an ongoing basis.

Q: Is professional accreditation on the agenda?

A: Yes, constantly. RIBA accreditation has gone through 2 validations. There is a policy of best practice and setting of benchmarks and standards across all programmes in order to encourage the gaining and maintenance of Professional Accreditation with organisations such as RIAI.

Bachelor of Arts (Honours) in Interior Architecture SG_JINTE_H08

Note: Only Interior Architecture & Design Course in Ireland

Q: Does title represent 50/50 split between Interior architecture, and design elements of the course?

Q: Does the course have membership of the IDI?

A: Yes

Bachelor of Arts in Performing Arts (Theatre Design) (Ab-initio) SG_APERT_B07

Bachelor of Arts (Honours) in Performing Arts (Ab-initio) SG_APERF_H08

helor of Arts in Performing Arts (Acting) (Ab-initio) SG_APERA_B07

Performing arts staff presented an overview of the Programmes

Q: How does work placement function in performing arts

A: There is a Memorandum of Understanding with the Abbey theatre and the Hawkswell theatre. The connection with the Abbey Theatre is unique amongst third level in Ireland.

- Students present a portfolio of experience after work placement

Note: Performing arts also brings students to Hungary for 2 weeks every year to engage in a masterclass performing arts programme. This will hopefully be funded by Erasmus if made an integral part of the curriculum.

Note: Acting for camera must become part of the course.

- Professional practice module must have more emphasis
- Documenting activities and progression is crucial to all courses

Q: Are people concerned about the lack of project space?

A: This is being addressed the K and L block plans

Note: A discussion about how students engage with current workspace ensued. The key issue raised was that creative specs are not 9 – 5 like conventional jobs and this must be reflected in the access to project space.

Bachelor of Arts (Honours) Writing and Literature (Ab-initio) SG_HWRIT_H08

Q: Is there a potential for online learning in Writing and Literature?

A: There is the issue of trust and probity in online writing where there is less interaction

- Ideas generation and sharing is different in online community.
- Academic modules might work well online

Q: How much is Yeats sold in marketing the Department?

A: The department is only beginning to engage with the force of association with the name Yeats and all of its implications across literature, design and theatre.

Note: The Joseph Downs building should also be included in the marketing campaign promoting the department.

Creative Design

Bachelor of Arts in Creative Design (Ab-initio) SG_DCRDS_B07

Bachelor of Arts in Creative Design (Ab-initio) SG_DCRDS_H08

Bachelor of Arts (Honours) in Creative Design (Add-on) SG_AARTT_K08

Note: Changed from Industrial design. Design principles and understanding of context and culture are key parts of the Programme

Note: Course is very broad. However, it is going down a very interdisciplinary route as is congruent with current trends in the area.

Q: Is there a need for a unique selling point? If so what is it?

Q: How much change in the course is informed by external stakeholder feedback versus internal idea generation?

A: There is substantial change which is informed by external SH feedback however there is significant disagreement about what it is that a product designer does. Creative Design needs to be able to provide a good grounding across the board.

Q: What changes are occurring in response to students experience in the workplace/ industry?

A: More focus on soft skills which prepare students for entry into work

Fine Art

Bachelor of Arts in Fine Art (Ab-initio) SG_AARTT_B07

Bachelor of Arts (Honours) in Fine Art (Ab-initio) SG_AARTT_H08

Overview given:

- 2016 Ab-initio developed
- 50/50 school leavers to mature students
- Large diversity of student types and backgrounds
- System is very general compared to other courses
- Strong emphasis on professional practice

- Drawing is a central pillar of course (enhances people's ability to perceive and think in lateral ways)
- International trip each year

Note: It is critical to contextualise Fine Art in an international Context

Q: Where do students primarily arrive from?

A: PLC portfolio courses play a large part in sustaining FA programmes.

Q: What changes are going to occur as FA progresses?

A: Interdisciplinary is emerging as a key factor in creative courses and YAADA is engaging with this zeitgeist based upon industry and student feedback.

- The courses are focusing more and more on collaborative practice and professional practice. This is done with the understanding that many Art students work as sole traders on leaving formal education
- The definition of research is as much an issue for FA as it is for other YAADA programmes and the progression of this definition will inform change

Q: Do students have the same experience of Art and Design theory as they do in IT Sligo?

A: The Fine Art faculty are constantly in communication with the portfolio courses so that there is as seamless as possible a transition.

Q: What is being done about Masters level education in Fine Art?

A: New Programmes of learning for Masters are currently being validated and 90% of students say they would prefer to stay in the region to undertake their masters.

Department of Civil Engineering and Construction

Panel team:

Title	Name	Surname	Role	Institution/Company
Dr	Ken	Thomas	Head of School – Engineering	Waterford Institute of Technology
Mr	Brendan	Henry	Managing Director	Kilcawley Construction
Mr	David	Kiely	Director	Jennings O Donovan
Dr	Roisin	Murphy	Senior Lecturer	TU, Dublin

Dr. Ken Thomas welcomed all of the attendees and introduced the panel followed by each of the Programme Chairs introducing themselves. Trevor McSharry (HOD) gave a brief overview of his department and the development of the full-time and part-time and online courses. The HOD spoke about the challenges that the department faced during the economic recession which started in 2008 and the strategic plans for the department in line with Faculty plans and the overall Strategic Plan for the Institute. The HOD also spoke about some of the department highlights since the last Programmatic Review 5 years ago, which include strategic collaborations with professional bodies such as EI and SSCI, development of the MEng in Civil Engineering and the development of Advanced Wood and Sustainable Building Technology at a time when Carpentry and Joinery apprenticeships were non-existent. The HOD listed the new programmes that have been developed since the last Programmatic Review and spoke about ones that are in the next developmental phase. The three Masters programmes and PhD by research were also discussed. The panel recommended building expertise in the area of off-shore Energy and off-shore geotechnical areas.

Q. What is the department doing to focus on the Low Carbon Economy by 2050 strategy, building 'sustainability' into the courses?

A. The department have made changes to courses and modules to increase sustainability and environmental content.

Q. How is the work-placement being built in to the courses?

A. The work-placement runs from April to June, with the possibility of students continuing to work for the company over the summer months. The work-placement is credited and the students either pass or fail their work-placement.

Q. How do the Inter-disciplinary projects work in reality?

A. The projects are based on real-life client briefs. Students across the department work on different elements, for example, the Architects work out the design, Civil Engineers work out the site, quantity surveyors cost out the project and the Project Managers schedule the execution and feasibility plan.

Q. What is the breakdown between continuous assessment and exam assessment for online courses versus full-time courses?

A. The breakdown between the two cohorts is the same.

Q. What is the balance between continuous assessment and exam assessment?

A. The balance is 60/40 and this is consistent across the programmes within the department.

Q. How is topic 'Ethics' dealt with within the course programmes, especially in preparing itself for Internationalisation (of workers/ employer/ students etc.)?

A. This was a recommendation from the previous Programmatic Review and Ethics is now embedded into modules such as Professional Practice across the department.

Q. Global Working – how does the department link with graduates of the courses?

A. The department uses Linkedin to stay in touch with graduates. The Institute launched an Alumni platform called Konnectagain a few times over the last couple of years but this hasn't really gained traction. The plan is for the Institute to expand its presence with Linkedin and increase its connections with past students, who may also be possible funders to the Institute and possible employers to our current students. Some programmes use Facebook pages to connect with students while they are a current student and remain in contact post-graduation.

Q. How is the department managing to meet the TU metrics?

A. The department is motivated by the TU metrics to recruit new staff that have a PhD qualification. While Civil Engineers may have a PhD it is not common for Quantity Surveyors to have a level 10 qualification as it is not required by Industry. It may be possible that TU metrics could be met using equivalent professional Chartered qualifications. The Institute is aiming to submit for the TU process by April 2020. Another important metric is students studying or qualifying with a level 9/10 research qualification and in order to achieve this metric, bursaries and stipends have been introduced.

Individual programme or suite of programmes revalidation process

L8 Bachelor of Engineering (Hons) in Civil Engineering (Ab Initio)
L8 Bachelor of Engineering (Hons) in Civil Engineering (Add-on)
L7 Bachelor of Engineering in Civil Engineering (Ab Initio)

Changes have been made to these courses in response to feedback from stakeholders, from Industry and from the HEA report that students need to be better informed which discipline of Engineering they are best suited to.

L8 BEng (Hons) in Civil Engineering (Ab Initio)
There have been no major changes to the programme since 2013 although there may have been minor changes in relation to module titles, sequencing and assessment details.

Proposed changes:
In order to facilitate the common first year, a number of new modules have been introduced:

- Introduction to Programming
- Engineering Graphics and Computer-Aided Engineering
- Electrical Principles Engineering
- Introduction to Professional Engineering
- Multidisciplinary Design Project.
- Surveying: The first year surveying modules are to be moved to second year to accommodate the common engineering first year.

- Human Resources and Personal Development: In semester 2 year 2 HRPD will be replaced by Introduction to Professional Engineering in semester 2 year 1.
- Engineering Mechanics 101 & 102: The titles of Structures 101 and 102 have been changed to Engineering Mechanics 101 and 102 to better facilitate commonality. Engineering Science 101 and 102 have been renamed Engineering Physics and Engineering Chemistry.
- Work Placement: The introduction of Work Placement will necessitate shortening semester 2 year 3 to allow students to commence placement around April 1st. The number of modules in semester 2 has been reduced from 6 to 5 and the hours allocated to the remaining modules have been increased to compensate.
- Hydraulics 302H has been discontinued. The Environmental Eng 302H module will be replaced by Work Placement and content transferred to Environmental Eng 301H module with an increase of theory hours from 2 to 3 per week. Some material is also covered sufficiently in Environmental Eng 201H.
- Final Year Project: Work on the Final Year Project begins in Year 4 Semester 1 and with a view to balancing out the work load over the year Civil Engineering Law 402H has been moved to semester 2. This results in semester 1 having 25 ECTS credits while semester 2 has 35 ECTS credits.

L8 BEng (Hons) in Civil Engineering (Add-on)

There have been no major changes to the programme since 2013 although there may have been minor changes in relation to module titles, sequencing and assessment details.

Proposed changes:

- A 12-week work placement has been introduced towards the end of Year 3, semester 2.
- Environmental Eng 302H module will be replaced by Work Placement and content transferred to Environmental Eng 301H module with increase of theory hours from 2 to 3 per week in the Level 8 programme. Some material will also be covered sufficiently in Environmental Eng 201H.

L7 BEng in Civil Engineering (Ab Initio)

There have been no major changes to the programme since 2013 although there may have been minor changes in relation to module titles, sequencing and assessment details.

Proposed changes:

- Surveying: First year surveying modules in all Civil Engineering programmes are to be moved to second year to accommodate a common engineering first year.
- Building Information Modelling (BIM): A new module Building Information Modelling is being introduced in Semester 2 of the level 6 & 7 programmes.
- Engineering Graphics and Computer-aided Engineering: This is a new module which is being introduced in Semester 1.
- Engineering Mechanics 101 & 102: The titles of Structures 101 and 102 have been changed to Engineering Mechanics 101 and 102 to better facilitate commonality. Engineering Science 101 and 102 have been renamed Engineering Physics and Engineering Chemistry.
- Environmental Engineering:
- The modules Wastewater Treatment 202 and Water Supply 302 modules are proposed to be replaced with Environmental Engineering 202 and Environmental Engineering 302.
- The Wastewater Treatment 301 module has been moved to Semester 2 (Wastewater Treatment 302).
- Final Year Project: Work on the Final Year Project begins in Year 3 Semester 1 and with a view to evening out the work load over the year Wastewater Treatment 301 and Contract Administration have been moved to semester 2 while Highway Engineering has been moved to Semester 1. This results in semester 1 having 25 ECTS credits while semester 2 has 35 ECTS credits

L6 Higher Certificate in Water and Waste Water Treatment Operations

L6 Certificate in Introduction to water and Waste Water Treatment Operations

L6 Certificate in Drinking Water Treatment Operations

L6 Certificate in Waste Water Treatment Operations

There have been no major changes since the programme was approved last year in 2018.

Proposed changes:

None.

L9 Masters of Engineering in Road and Transport Engineering

L9 Post Graduate Diploma in Road and Transport Engineering

L9 Certificate in Engineering Road Network Management

L9 Certificate in Road Maintenance Engineering and Network Management

Proposed changes:

The proposed changes to the major, minor and SPA awards being reviewed largely relate to minor changes and updates to individual module learning outcomes, resulting in some updating of module titles, learning outcomes, and assessment strategies.

- Decoupling of Geotechnical Engineering and Drainage Systems from the two current joint modules Geotechnical Engineering & Drainage Systems in Semester 1 and Geotechnical Engineering & Drainage Systems Design in Semester 3 of the programme to form two new modules, Geotechnical Engineering I and Drainage Systems Design & Flood Management.
- Research Methods: a revised module for Research Methods.
- Drainage Systems module: the proposed new Drainage Systems module encompasses Flood Management in the title along with to reflect the teaching and learning emphasis more accurately.

L8 Bachelor of Science (Hons) in Construction Project Management (Add-on)

L7 Bachelor of Science in Construction Management (Add-on)

L8 Bachelor of Science (Hons) in Construction Project Management (Add-on)

The content of all modules was considered in detail and refined to remove subject duplication and to ensure better overall alignment.

Proposed changes:

- Projects & ICT: the title of the module is changed to 'Digital Construction Technology' and new software packages have been introduced such as: Navisworks, Synchro Pro, ReCap and BIM 360.
- Dissertation in Construction Project Management: 'Literature review' section (35%) is to be handed up and marked at the end of semester 1. This along with half of the continuous assessment marks (5%) amounts to 40% for semester 1. This is instead of having 100% of the marks solely at the end of the academic year.
- Construction Corporate Management: reduction in the content on 'strategy' and incorporation of additional content pertaining to 'leadership', 'motivation', and 'managing people (personnel management)'.
- International Construction: conjoining content on 'mergers & acquisitions' has been removed from other modules, and have aligned it into this module exclusively. 'International project failures: lessons learnt' has also been incorporated.
- Development Appraisal & Economics and Construction Financial Management: both modules have been combined to create a new module called 'Project Appraisal, Procurement & Finance'.
- Construction Law, Liabilities and Obligations: amended by the inclusion of more construction contact/administration content. The introductory to law element has been reduced and will be delivered as a pre-recorded lecture.
- Construction Planning and Programming: amended to include additional estimating content as the expense of the introduction to planning within organisations. More emphasis is being placed on importance of both site layout planning and method statements in the planning process.
- Project Management and Control: existing subject content relating to lean, quality and supply chain management has been transferred to the new module Lean Principles & Quality Management. Content relating to leadership, motivation and teams have been transferred to Corporate Construction Management. In the void left the following has been included; Building Control Amendment Regulation, expanded content on Health and Safety Management, Project Lessons Learned, Earned Value Management, Design Management and Subcontractor Management.

- Construction Contracts & Dispute Resolution: contract administration has been added in the learning outcomes and will focus on administration of the Public Works Contract.
- Lean Principles & Quality Management: a new module Lean Principles & Quality Management has been introduced. The inclusion of this new module was facilitated by the amalgamation of Development Appraisal & Economics and Construction Financial Management to form a new module Project Appraisal, Procurement and Finance.

L7 Bachelor of Science in Construction Management (Add-on)

The module titles of a number of modules in the programme are to change to better reflect the content of these modules and make the course content clearer and more attractive from a marketing point of view.

Proposed changes:

- Re-naming the existing Communications & CAD module to BIM Fundamentals & Revit in semester 3
- Creation of new module BIM & Collaboration in semester 4.
- To accommodate the new BIM & Collaboration module above, the two Measurement and Costing 1 & 2 modules worth 10 credits in total will be condensed into one 5 credit module in QS Skills and Cost Control.
- Inclusion of content on Lifecycle cost and lean construction to the modules Project Feasibility & Appraisal and Project Programming and Control.
- Increased or updated content on Health & Safety, professional development and codes of practice in the *Site Management* module.
- Inclusion of NZEB building regulations in the Building Surveying module
- Increased content on defects emerging in modern construction such as fire regulation non-compliance and preventative maintenance.

L9 Masters of Engineering in Road & Transport

Proposed changes:

The proposed changes to the major, minor and SPA awards being reviewed largely relate to minor changes and updates to individual module learning outcomes, resulting in some

updating of module titles, learning outcomes, and assessment strategies. Programme outcomes are largely unaffected by any changes in modules with minor updating of module learning outcomes and teaching & learning and assessment strategies to reflect stakeholder feedback and updates to technologies, standards and practices.

- Decoupling of Geotechnical Engineering and Drainage Systems from the two current joint modules Geotechnical Engineering & Drainage Systems in Semester 1 and Geotechnical Engineering & Drainage Systems Design in Semester 3 of the programme to form two new modules, Geotechnical Engineering I and Drainage Systems Design & Flood Management is the major change in the programme.
- Other changes to modules include a revised module for Research Methods, to be more compatible with requirements of research projects/dissertations for Master in Engineering programmes, and the emphasis of certain modules towards bridges, i.e. Renaming of Structural Assessment and Inspection module to Structural Inspection & Assessment of Bridges, and on design aspects, i.e. Bridge Structures module renamed as Design of Bridge Structures.
- The proposed new Drainage Systems module encompasses Flood Management in the title along with to reflect the teaching and learning emphasis more accurately.

L8 Bachelor of Science (Hons) in Quantity Surveying Ab Initio
L8 Bachelor of Science (Hons) in Quantity Surveying (Add on)
L7 Bachelor of Science in Quantity Surveying Ab initio

Focus groups / meetings were carried out with the following stakeholders: Quantity Surveying Employers, Students, Graduates, External examiners, Professional Body (Society of Chartered Surveyors Ireland) to inform changes.

Proposed changes:
Module titles have been updated to reflect the content of the modules and to remove the numbering in the titles of certain modules.

- The introduction of a Learning Theory Module.
- Quantity surveying software is introduced in Semester 2 as opposed to an existing Year 3.
- The introduction of a Report Writing and Academic Writing Module.
- Level 7 and Level 8 Full-time students will get the benefit of work place engagement for a minimum period of three months carried out in Semester 6. Online students will carry out a project in place of the work placement.
- There will no longer be a Quantity Surveying Module Surveying, where students were learning the use of dumpy levels and staffs to establish ground levels and contours. This manual surveying function is replaced with earthwork quantities calculation software using 3D models for cut/fill exercises as part of a civil engineering measurement module.
- The students will still be introduced to Computer Aided Design (CAD), but they will no longer be producing CAD drawings using software but will be examining measurement, scheduling and quantity take off functions of BIM models.
- Two 5 credit modules in year 4 (Capstone Project 1 and Capstone Project 2) are being amalgamated into 1 year-long 10 credit Capstone Project module. This longer module approach follows best practice in ensuring that students at year 4 of a Level 8 programme have sufficient duration to develop educational learning objectives at higher levels of complexity and specificity.

L7 Bachelor of Science in Advanced Wood and Sustainable Building Technology

HOD explained that the 6 construction modules still have to be finalised between 2 programme boards; Quantity Surveying and Advanced Wood & Sustainable Building Technology.

Proposed changes:

Some new modules have been added to the programme as outlined below. Generally most of the remaining modules have been updated to incorporate the latest technology and

innovations in the construction industry some minor changes have been made to the titles, learning outcomes and indicative syllabus.

- Two standalone 5 credit Surveying modules have been created in semester 1 and 2. The subject matter of these two modules was previously contained in the 10 credit Sustainable Construction Technology modules now a 5 credit modules.
- Computer Aided Design has moved from year 2, it has been incorporated into the Graphical Communication and Design hand drawing module. Hand drawing has been removed from year 2 and year 3 year making way for extra modules in Building Information Modelling and ICT.
- Advanced Manufacturing has been removed from year 3 and combined with Applied Construction Technology.
- Building Information Modelling (BIM) modules has been moved from year 3 to year 2 to replace the Computer Aided Design modules.
- A new 5 credit Project Design and management module in semester 1 and a new 5 credit ICT for Construction module in semester 2 have been created to replace the 10 credit Graphical Communication and Design modules.
- Sustainable Construction Technology 5 and 6 changes to Industrial and Commercial Construction 1 and 2.
- A new 5 credit module Building Analysis and Adaptation and two new 5 credit Building Information Modelling modules have been created.
- Work Placement is now embedded in the programme as a 10 credit module in semester 2 in line with the Institute strategic plan.

Part 7 Meeting with Student Representatives and External Stakeholders

Meeting with External Stakeholders

List of external stakeholders in Appendix 6

The panel sought the views of the employers present in relation to their perception of the graduates of IT Sligo in terms of having the required knowledge, skills and competencies for their industries. Graduates are perceived as well prepared for the workforce. This they believe is a result of the close working relationship they have with IT Sligo who modifies programme content to address identified needs. The presence of IT Sligo was one of the reasons some had chosen to locate their companies in Sligo. IT Sligo can provide R & D support and a range of online CPD opportunities for employees. Employers are invited to serve of committees, guest lecture, contribute to programme design and serve on programme validation panels. IT Sligo was perceived as having a very *forward way of working* with local and regional industry.

Meeting with Student Representatives

List of students is provided in Appendix 6

The Chairperson gave an overview of the purpose of the programmatic Review for the Faculty of Engineering & Design. He stated the panel would like to find out about students involvement in the programmatic review process, their experience of work placements, perception of assessments, feedback, awareness of the strategic plan and what influenced their decision to come to IT Sligo.

Students informed the panel that they chose to come to IT Sligo for a number of reasons- programme choice, accessibility and for financial reasons. The students present did not convey to the panel that they would be exiting the college with significant debt and this was due in part to the grants/ schemes they were accessing such as the Back to Education Scheme for a mature student.

Work placements

A small number of the student cohort and completed a work placement in semester 6, year 3 and found it an enjoyable experience which served to bridge the theory practice gap and facilitated the development of some of the competencies in their particular specialism. The students conveyed having problems sourcing placements with limited guidance from their Department and a general lack of information about the work placement.

Student supports/ feedback

The student were very positively inclined towards the new supports that have been instigated in recent times such as the Maths support Centre. Students reported that they were invited to provide feedback after the completion of each module.

Programme information

Students reported mixed experiences in relation to receiving specific programme information with some receiving detailed information on modules/ assessments etc. at the beginning of each semesters to others reporting receiving limited information which indicated to the panel a lack of consistency with respect to programme specific information across the Faculty.

Awareness of strategic plan/ involvement in programmatic review process.

A small number of the student were aware of the Institutes strategic plan 2017-2022. Students reported that they had been involved in the review process. They had being informed of it by the Head of Faculty and their views were fed through their student union/ programme representatives. They found their participation a positive experience where they learnt about issues such as proposed infrastructural developments.

Gender behaviour and awareness

One student chose to meet the panel on her own (who informed the panel she was representing her female peers) to express her deep concern about the behaviour of male students in her programme and how it was perceived as disrespectful. The student seemed unaware of the Student Charter and of other avenues she could deploy to assist her address this issue.

Part 8 Findings and Recommendations

The Panel recommends the revalidation of the Programmes (Appendix 7) that were presented to it for 5 years subject to the conditions and recommendations listed below.

Faculty of Engineering & Design

Commendations:

1. The panel commends the rigorous review process undertaken by the Faculty and Department teams based on close links with industry.

Recommendations:

1. The management model of work placement both centralised and within Departments, needs to be reviewed and developed for robust QA and coherent relationships with stakeholders.

2. There is scope for greater marketing of online programmes in order to facilitate growth. The management of online programme provision needs to develop a robust QA model for assessment and student support.

3. The Alumni relationship needs to be developed further for the benefit of students and the wider Faculty.

4. The resourcing and distribution of staff, administration, management and space resources across Departments requires on-going capacity review as the new Department structure evolves.

5. The Gender balance make up across the Faculty to be considered in the context of ambitious growth targets. Actions could include the level of marketing, configuration and design of work spaces, nature of projects undertaken and general awareness of gendered conditioning of the engineering space.

6. The issue of gender behaviour and awareness of appropriate behaviour in relation to gender was raised in the student meeting and needs to be considered in relation to dignity and respect policy/students charter and consent education.

Condition:

1. Inconsistencies between volume 2 and volume 3 in relation to hours and credits to be resolved in the documentation.

Department of Computing & Electronic Engineering

Commendations:

1. The panel commend the introduction of work placements on all NQF level 8 programmes.
2. The panel commend the Institute on the development of C.E.L.T. and the introduction of the Maths Support and Academic Writing centres.
3. The panel commend the Faculty on restructuring of Departments to support new developments.
4. The panel commend the development and introduction of new modules to reflect the changing needs of Industry.

Recommendations:

1. All students should have an awareness of online collaborative working processes and practices.
2. Approved programme schedules should clearly reflect the programme delivery hours.
3. The requirement for an ICT project room needs to be substantiated.
4. There is a need to quantify the numbers of students with a disability and/or mental health issue and/or literacy and/or social issues.
5. The Department's feedback to Faculty on their Quality Assurances processes requires clarification (EAP 7).

Department of Mechatronic Engineering

Mechatronics & data centres

Commendations:

1. The panel commended the structure and delivery of programmes and engagement of the programme team in the review.
2. The increase in student numbers indicates a high level relevance of the programmes.
3. On line retention rates are excellent.
4. Use of WIRIS software successfully enhances students learning.

Recommendations:

1. The resourcing, staffing and capacity planning of the Department for growth, needs to be more proactive.
2. The management of trades at Faculty and Institute level needs to be kept under review as this area grows.
3. The provision of a CDIO facility would be beneficial.
4. Course Assessment schedules are made available to students.
5. Marking systems reflect individual and team based contribution to projects. These rubrics to be given to students as part of their project brief.

Polymers

Commendations:

1. The currently unique provision of programmes at NQF level 6, 7 & 8 provides a service to a growing market
2. It is evident that programmes are coming to maturity in terms of content provision.

Recommendations

1. Reference to Minitab software and solid works software is visible within NQF level 7 & 8 modules, namely Polymer tooling design, experimental design and statistics.
2. Modifications to control 301 module are made (or a new module is developed) on the NQF level 7 programme to incorporate robotic and control equipment, Euromap interface equipment.
3. Recycling polymers is included on programmes at NQF level 6 and 7. Update module descriptors to include recycled polymers and the implication on post-consumer, post-industrial and additives.
4. The unique aspects of programmes to be marketed more robustly internationally.
5. The provision of polymer lab facility to enhance the capability of polymer programmes to deliver in- house practical exercises.

Department of Mechanical & Manufacturing Engineering

Department Specific Commendations

- The Panel acknowledges that the Programmes board have put considerable time and effort into creating appropriate modules and putting them on Module Manager in time for the review
- The Panel were impressed with the quality and presentation of the documentation
- The panel were impressed with the staff engagement and open discussion during the site visit
- The Panel commends the quality of the final year projects and their success in National competitions
- The Panel acknowledges the effective work placement structure and effective assessment practices in place on the Precision Engineering and Design programmes.

Quality suite of programmes:

Commendations:

1. The panel commends the positive engagement of the programme teams.
2. The panel commends the excellent survey and actions taken based on responses, with relevant changes made to programmes.

Recommendations made captured at Faculty level

Mechanical Suite of Programmes and Precision Engineering and Design suite of Programmes

Condition:

1. The Approved Programme Schedules have a number of modules listed with Failed Elements. The appropriateness of these failed elements need to be reviewed by the relevant Programme Boards.

Recommendations

Mechanical Suite of Programmes

1. Work placement should follow a similar model to the current Precision Engineering and Design programme in terms of operational logistics and assessment methodology. The programme team need to ensure that there is an alternative programme for students who are unable to find work placement.
2. The development of a level 8 Ab Initio in Mechanical Engineering is recommended by Panel
3. Review the repeat assessment strategy for all modules
4. Include transfer and progression information on Module Manager documentation
5. Review pass/fail grade in year 4 Fluids module
6. The contact hours for the 'Integrated Project' module in semester 5 should revert to Faculty norm

Precision Engineering and Design Suite of Programmes

1. The contact hours for the 'Integrated Project' module in semester 5 should revert to Faculty norm. The online programme 'Project' contact hours also need to be reviewed
2. The development of a level 8 Ab initio in Precision Engineering and Design is recommended by the Panel
3. The programme team need to ensure that there is an alternative programme for students who are unable to find work placement

Certificate in Mechanical analysis & Automation Level 6

Recommendation

1. Contact hours need to be consistent between approved programme schedule and module information provided on module manager.

Department of Arts, Design and Architecture

Commendations:

1. The panel welcomes the inclusion of enterprise and business skills within creative programmes.
2. The panel commend the commitment and passion of the Department staff.
3. The panel commend the formation of YAADA as a discrete Department and the benefits this could yield for the programmes therein.
4. The panel commended the Programme team for making programme titles more reflective of course content.

Recommendations:

The panel recommend:

1. The Institute policy on external examiners needs to be reviewed to encompass the requirements of YAADA.
2. The development of a USP across the suite of creative courses, such as inter-disciplinary practice would strengthen the identity of YAADA.
3. Research is defined in the context of the discipline.
4. The inclusion of field trips in modules is encouraged.
5. That alternative access routes to YAADA programmes are explored.
6. That RIAI approval is maintained to ensure the future success of the programmes and students eligibility to practice architecture
7. That the Department need to consider what parameters apply to Dissertation output in their discipline so equity across programmes exist.
8. The Department consider a common first year across Preforming Arts, Set Design and Writing & Literature.
9. The Department considers how they can maintain the integrity of the programmes whilst meeting the strategic plan action 1.1 (4) for online / blended learning to be incorporated into full time programme delivery.

Department of Civil Engineering and Construction

Civil Engineering suite of programmes:

Commendations:

1. The panel recognises the huge volume of work the programme team have put into the document and the enthusiasm shown.
2. The panel commends the introduction of the common first semester in the Ab-initio level 7 and the common first year in the Ab-initio level 8 programmes.
3. The panel also commends the team on the championing of BIM technologies in the sector.

Recommendations:

1. The Department considers developing a strategic approach to Internationalisation. This includes incoming students as well as Irish students travelling abroad during their studies.
2. The Department considers further developing and marketing its expertise in the sustainability agenda and promotion of the UN Sustainable Development Goals.
3. The Department build expertise in the area of off-shore geotechnical areas.

Water Treatment Operations programmes:

Commendations:

1. The panel recognises the huge volume of work the programme team have put into the document and the enthusiasm shown.

Recommendations:

1. The Department to consider the potential to offer these programmes to other jurisdictions and countries.

Road and Transport Engineering suite of programmes

Commendation:

1. The panel recognises the huge volume of work the programme team have put into the document and the enthusiasm shown.

Recommendation:

1. The Department to consider marketing the MEng more extensively to L8 Civil Engineers as a means to become eligible for chartered membership with Engineers Ireland.

Construction Project Management suite of programmes

Commendation:

1. The panel recognises the huge volume of work the programme team have put into the document and the enthusiasm shown.
2. The panel commends the team on the championing of BIM technologies in the sector.

Recommendation:

1. The panel recommends that the Department considers reviewing and enhancing the proctoring system to ensure exam assessment integrity.

MSc in Project Management

Commendation:

1. The panel recognises the huge volume of work the programme team have put into the document and the enthusiasm shown.

Recommendation:

1. The panel recommends that the department should consider getting professional accreditation for the whole award or the streams within the programme.

Quantity Surveying

Commendations:

1. The panel recognises the huge volume of work the programme team have put into the document and the enthusiasm shown.
2. The panel commend the inclusion of *Safe Pass certification* and the introduction of report writing skills.
3. The panel commend the option of a project as an alternative to a work placement for online students in employment.
4. The panel commends the team on the championing of BIM technologies in the sector.

Note: Recommendations dealt with a Faculty level

Advanced Wood & sustainable technology

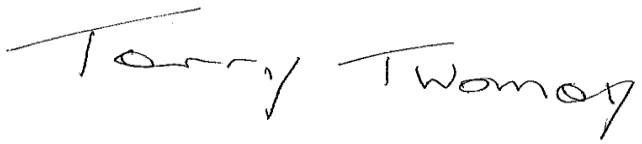
Commendation:

1. The panel commend the maintenance of the major project in the programme through their incorporation in Advanced Construction 1 and 2.

Condition:

1. All modules to be completed and subjected to internal review before the programme commences in September.

Signed on behalf of Programmatic review panel



Michele Glacken

Mr Terry Twomey

Chairperson

Date: 28.6.2019

Dr Michele Glacken

Assistant Registrar

Appendix 1 Agenda

Evening Before *May 6th*

Date/Time	*Item*	*Room*
19.00	**Private meeting of the Panel**: Discussion of documentation and identification of points for special consideration. Confirmation of the agenda. Chapter 5 of IT Sligo QA Manual Outlines scope. Assistant registrar in attendance	Clayton Hotel
20:00	Panel dinner With Faculty Head, HoDs and Assistant Registrar	Clayton Hotel

Day 1 May 7th

Date/Time	*Item*	*Room*
08:30-09:30	**Private meeting of Panel**	Institute Boardroom, IT Sligo
09:30-09.45	Meeting with VP AA & Registrar and Head of Faculty - Strategic Plan, HEA Compact and TU.	Institute Boardroom, IT Sligo
09.45 – 10.45	Meeting with Head of School, Heads of Departments, Director of PEM on Faculty Plan **(INCLUDING COFFEE/TEA),** - Presentation by the Head of Faculty on a Faculty overview including student numbers; progression; International; Surveys; Staff profile; Faculty targets etc. Discussion on: - Faculty/Department Structure, and management & administrative structures - Academic Plan and Performance of the Faculty - Student throughput and student retention. - Student support services - Pedagogical strategies - Staff compliment (academic, technical & administrative), deployment and development - Physical facilities - Current Faculty Research activity (incl. level 9 & 10) - Research growth plans	Institute Boardroom, IT Sligo

Day 1 Continued 10.45-12:30	Five separate meetings with each Head of Department and their Programme Chairs. (Department/programmes in General) - Brief overview of the department function and structure in the context of the Institute and historical developments and interaction with industry. - External influences in the context of how they guide and drive changes in programmes - Discussion on overall programme performance since the last validation. - Identifying new programme markets/ niches	1. Inst. Board Room (Note taker. Assistant registrar) 2. E1006 Note taker. Nick Doran) 3. E1007 (Note taker. Dara Mc Goldrick) 4. E1008 (Note taker. Aoife Currid 5. F0010 (Note taker. Maeve

	- Programme marketing to relevant stakeholders (students/ parents/ career guidance teachers etc.) - Retention/ Progression rates - Operation of programme quality system and programme monitoring reports (EAP-7 forms). - Approach to student/ graduate and employer feedback - External examiner process and response to reports - Evaluation of the external environment affecting each programme and key inputs from survey of graduates/ - employers. - Future programme plans and development/ Relevance to the strategic plan and Faculty plan - Departmental Research & Innovation activities - Planned new programme development for the next five years.	Kelly
12:30-13.45	Lunch	Institute Boardroom, IT Sligo
13.45-16.30	**Programme Revalidation (5.7.1 Quality Manual Chapter 5) :** (Programme Board Chair & Lecturing/ technical staff as applicable for relevant programme/ suite of programmes) Each programme and/or suite of programmes: 1. Programme overview 2. Performance of Programmes since the previous revalidation 3. Evaluation of the external environment and feedback from stakeholders 4. Proposed Changes to Programmes 5. Operational Plans 6. Programme Board proposals for future	1. Inst. Board Room (Note taker. Assistant registrar) 2. E1006 (Note taker. Nick Doran) 3. E1007 (Note taker. Dara Mc Goldrick 4. E1008 (Note taker. Aoife Currid) 5. F0010 (Note taker. Maeve Kelly)
16.30 -17.15	Chair of break out groups and note taker to compile key decisions	In Breakout rooms, IT Sligo
17.00- 18.00	**Tour of facilities**	Institute Boardroom, IT Sligo
20:00	Panel dinner	Clayton Hotel

Day 2 May 8th

Date/Time	*Item*	*Room*
08.30- 09.00	Private meeting of Panel	Institute Boardroom, IT Sligo
09:00-11.15	**Programme Revalidation (5.7.1 Quality Manual Chapter 5) :** (Programme Board Chair & Lecturing/ technical staff as applicable for relevant programme/ suite of programmes) 1. Programme overview 2. Performance of Programmes since the previous revalidation 3. Evaluation of the external environment and feedback from stakeholders 4. Proposed Changes to Programmes 5. Operational Plans 6. Programme Board proposals for future	2. E1006 (Note taker. Nick Doran) 3. E1007 (Note taker. Dara Mc Goldrick) 4. E1008 (Note taker. Maeve Kelly) 5. Venue F0014 (Note taker. Aoife Currid)
09.00.09.45	Feedback to Department of Computing & Electronic Engineering Hof Faculty & HoD.	Panel members group 1 Inst. Board Room (Note taker. Assistant registrar)
11.15-11:45	Chair of break out groups and note taker to compile key decisions	Breakout rooms, IT Sligo
11:45-12:30	Private meeting of Panel **(Tea/Coffee)**	Institute Boardroom, IT Sligo
12:30-13:00	Meet with Student Representatives and with external Stakeholders	Institute Boardroom, IT Sligo
13-30 -14.00	Private meeting of Panel to agree Findings including top line conditions and recommendations	Institute Boardroom, IT Sligo
14.00	Feedback to Faculty and VP AA & Registrar and finish.	Institute Boardroom, IT Sligo
14.30	Lunch	Institute Boardroom, IT Sligo

Appendix 2: Membership of Review Panel

Mr. Terry Twomey VP Academic Affairs & Registrar, Limerick Institute of Technology **(Chairperson)**

Dr. Brendan Ryan Head of Department of Visual and Human Centred Computing, School of Informatics and Creative Arts Dundalk Institute of Technology

Mr. Keith Moran Managing Director, SL Controls, IDA Business Park, Collooney, Sligo

Dr. Mark Clarke Lecturer, Dundalk Institute of Technology

Dr. Alan Ryan Lecturer in Sustainable Automation, Quality Management & Supply Chain University of Limerick

Mr. Laurent Palasz NPPI Manager, LINDAL Group, Finisklin Business Park, Sligo

Dr. Olivia Mc Dermott Lecturer, Management Development Unit, University of Limerick

Ms. Maria Kyne Dean of Faculty of Applied Science, Engineering & Technology, Limerick Institute of Technology

Mr. Bernard Murray Panel Member Engineering Operations Manager, Abbvie

Ms. Aoife Deasy Student Representative, USI.

Dr. Adam DeEyto Head of School of Design, University of Limerick

Ms. Nollaig Crombie Head of Department for Design & Creative Media, Letterkenny Institute of Technology

Mr. Jim Culleton Artistic Director, Fishamble Theatre Company, Dublin 1

Mr. James Hamilton Architect, James Hamilton Architect, Belfast

Dr. Ken Thomas Head of School –Engineering Waterford Institute of Technology

Mr. Brendan Henry Managing Director, Kilcawley Construction, Sligo.

Mr. David Kiely Director, Jennings O Donovan, Sligo

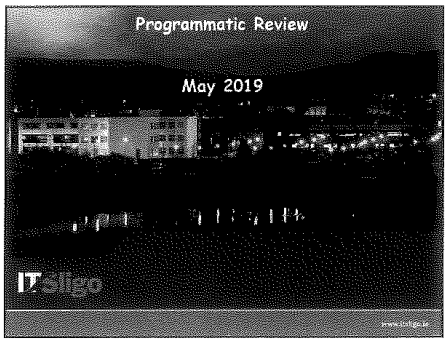
Dr. Roisin Murphy Senior Lecturer, Technological University of Dublin

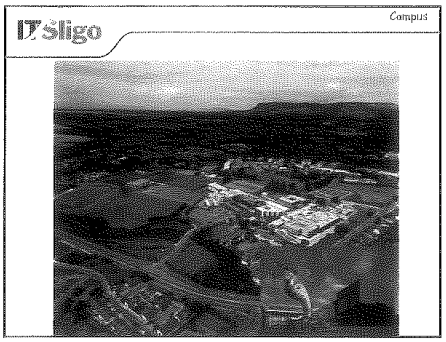
Appendix 3: List of documentation circulated to the Panel

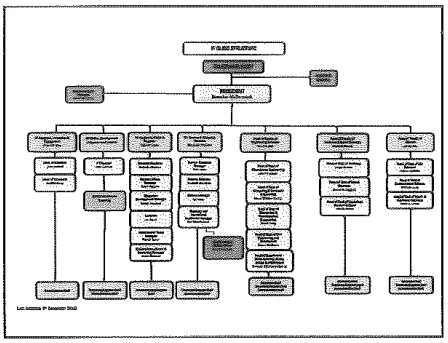
1. Agenda
2. Terms of Reference of Programmatic review
3. Quality Assurance Manual Institute of Technology Sligo -Chapter 5 - IT Sligo QA Procedures in relation to Programmatic review
4. Vol 1: Faculty of Engineering & Design self-evaluation report
5. Vol 2: Department specific self-evaluation report
6. Link to module manager containing all programmes and their module descriptors
7. Faculty planning panel validation report

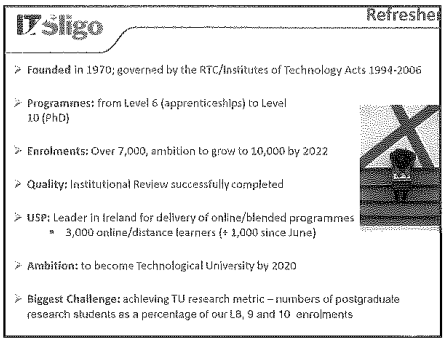
Appendix 4 Vice President for Academic Affairs P & Head of Faculty Presentations

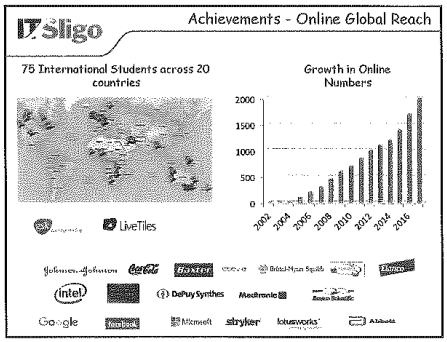
6/6/2019











IT Sligo — Institutional Review

- Main Review Visit 16-19th April 2018
- QQI Review Report
- Institutional Response
- Consideration of Review Report and Institutional by QQI Approval and Reviews Committee
- Published Report with IT Sligo Response
- Implementation Plan Developed
- One Year Follow up Report

IT Sligo — Overview

Overall

The Institution's quality assurance procedures are compliant with the ESG and have appropriate regard to QQI's statutory Quality Assurance Guidelines (QAG). Furthermore, the institution has established appropriate procedures for the overall operation and management of the institution as an awarding body, and delegated authority is exercised in a robust and diligent manner.

Commendation

Staff at all levels of the institution are passionately committed to giving students a good experience; and to the institution's mission and values. There is notable appetite for change and for the ambitious agenda that has been set by the Strategic Plan.

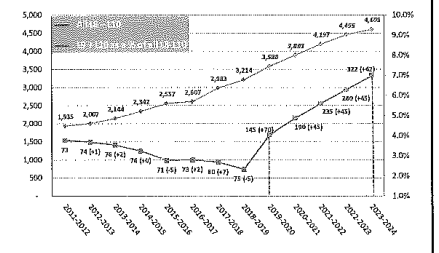
Recommendation

The Review Team recommends that the Institute continues and completes steps already being taken to: evaluate, streamline and thoroughly systematise quality assurance at IT Sligo. This should include the implementation of more data-driven, benchmarked and routine quality systems to improve efficiency and responsiveness of quality assurance and enhancement.

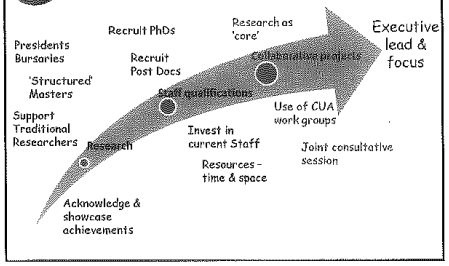
IT Sligo — Update on CUA

- Where is IT Sligo at?
- GMIT
- LYIT
- Submission Date

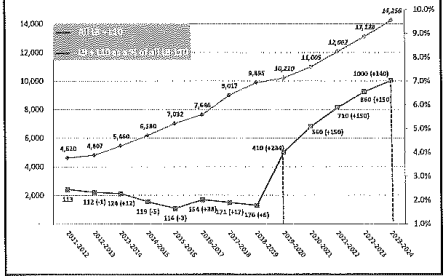
IT Sligo — Research numbers projections to meet TU criteria (ITSligo)

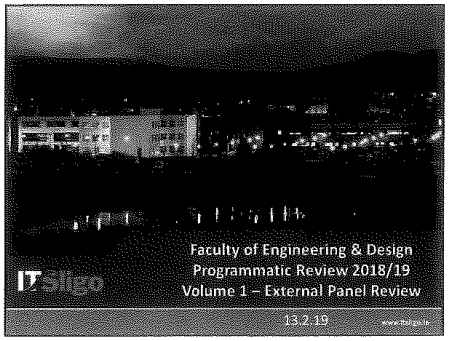


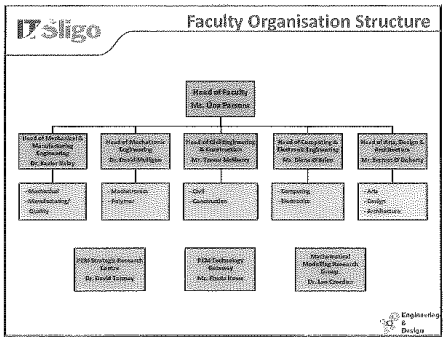
IT Sligo — Achieving the metrics

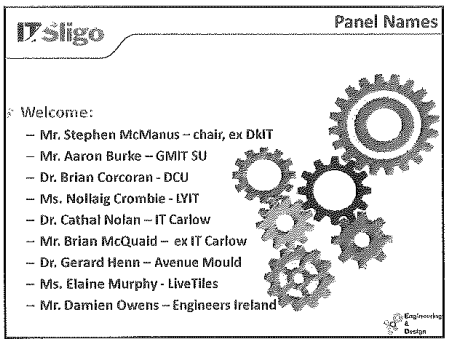


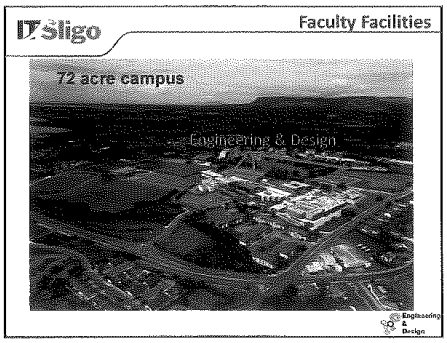
IT Sligo — Research numbers projections to meet TU criteria (CUA)



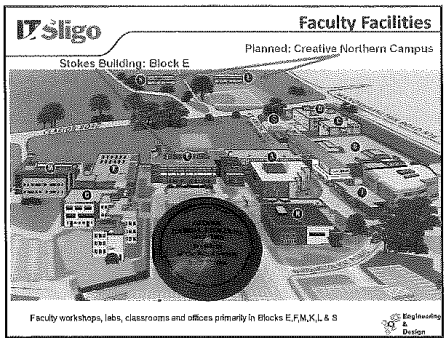

Faculty of Engineering & Design
Programmatic Review 2018/19
Volume 1 – External Panel Review
13.2.19

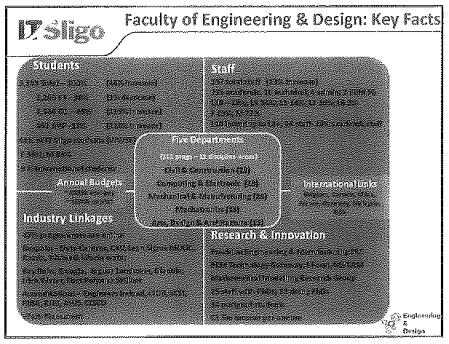

Faculty Organisation Structure

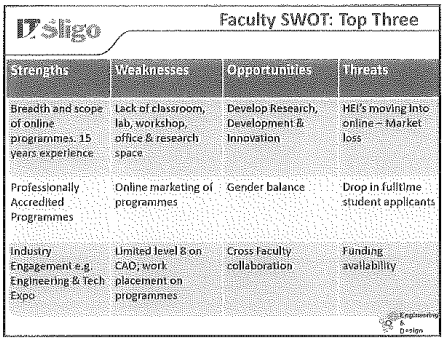

Panel Names
Welcome:
– Mr. Stephen McManus – chair, ex DkIT
– Mr. Aaron Burke – GMIT SU
– Dr. Brian Corcoran - DCU
– Ms. Nollaig Crombie - LYIT
– Dr. Cathal Nolan – IT Carlow
– Mr. Brian McQuaid – ex IT Carlow
– Dr. Gerard Henn – Avenue Mould
– Ms. Elaine Murphy - LiveTiles
– Mr. Damien Owens – Engineers Ireland

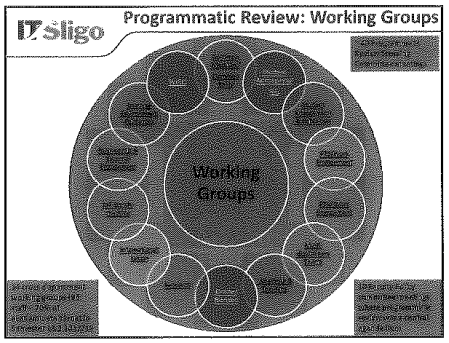

Faculty Facilities
72 acre campus
Engineering & Design

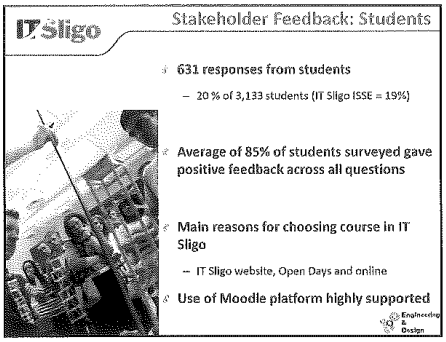
Agenda for the Day
10.00-10.15 President, VP Academic Affairs & Registrar, Head of Faculty
10.15-11.00 Head of Faculty, Heads of Departments, PEM SRC Director
11.00-11.15 Coffee
11.15-12.00 Head of Faculty, Heads of Departments, Programme Chairs and senior academic staff (Faculty Policy Committee)
12.00-13.00 Panel to identify Breakout groups into 3 topics
13.00-14.00 Lunch and meeting with employers and graduates
14.00-15.00 Tour of facilities (optional)
15.00-16.00 Private meeting of Panel to agree Findings including top line conditions and recommendations/Coffee
16.00 Feedback to Faculty
16.15 Finish

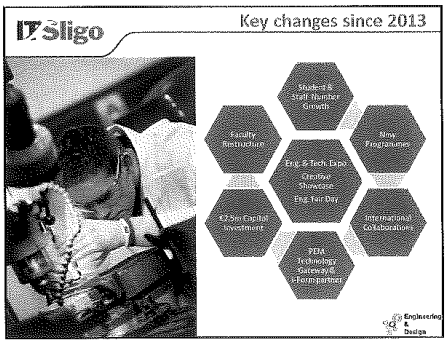

Faculty Facilities
Planned: Creative Northern Campus
Stokes Building: Block E
Faculty workshops, labs, classrooms and offices primarily in Blocks E,F,M,K,L & S

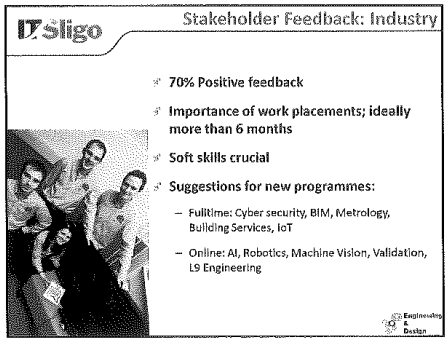

Faculty of Engineering & Design: Key Facts
Students
Staff
Five Departments
Annual Budgets
International Links
Industry Linkages
Research & Innovation


Faculty SWOT: Top Three
Strengths
Weaknesses
Opportunities
Threats
Breadth and scope of online programmes. 15 years experience
Lack of classroom, lab, workshop, office & research space
Develop Research, Development & Innovation
HEI's moving into online – Market loss
Professionally Accredited Programmes
Online marketing of programmes
Gender balance
Drop in fulltime student applicants
Industry Engagement e.g. Engineering & Tech Expo
Limited level 8 on CAO; work placement on programmes
Cross Faculty collaboration
Funding availability

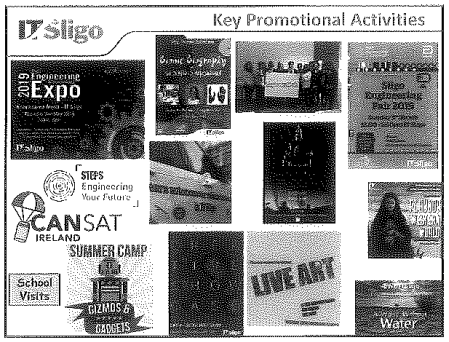

Programmatic Review: Working Groups
Working Groups


Stakeholder Feedback: Students
631 responses from students
20 % of 3,133 students (IT Sligo ISSE = 19%)
Average of 85% of students surveyed gave positive feedback across all questions
Main reasons for choosing course in IT Sligo
IT Sligo website, Open Days and online
Use of Moodle platform highly supported

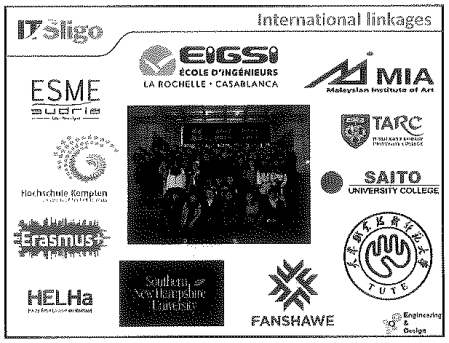

Key changes since 2013
Student & Staff Number Growth
Faculty Restructure
New Programmes
Eng. & Tech. Expo
Creative Showcase
Eng. Tair Day
€2.5m Capital Investment
International Collaborations
PEM Technology Gateway & i-Form partner


Stakeholder Feedback: Industry
70% Positive feedback
Importance of work placements; ideally more than 6 months
Soft skills crucial
Suggestions for new programmes:
Fulltime: Cyber security, BIM, Metrology, Building Services, IoT
Online: AI, Robotics, Machine Vision, Validation, L9 Engineering

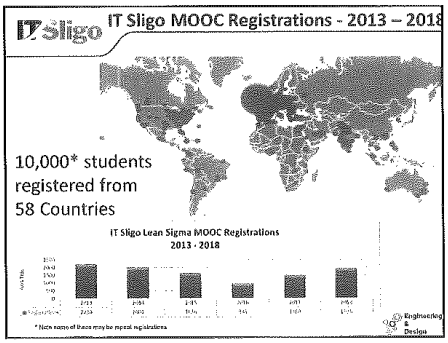
2


IT Sligo
Key Promotional Activities
Expo
STEPS Engineering Your Future
CANSAT IRELAND
SUMMER CAMP
School Visits
GIZMOS & GADGETS
LIVE ART
Water

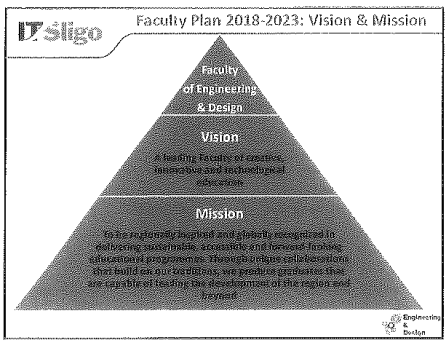
IT Sligo
Applied Research within Faculty
PEM
Precision Engineering & Manufacturing
TECHNOLOGY GATEWAYS
delivering solutions for industry
Science Foundation Ireland
sfi
For what's next
I-Form
Advanced Manufacturing Research Centre
ENTERPRISE IRELAND
where innovation meets business
NWCAM

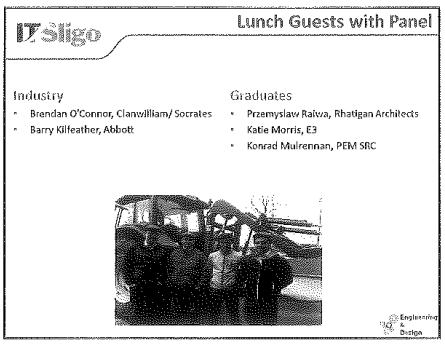

IT Sligo
International linkages
EIGSI
ÉCOLE D'INGÉNIEURS
LA ROCHELLE · CASABLANCA
MIA
Malaysian Institute of Art
ESME
sudria
TARC
SAITO
UNIVERSITY COLLEGE
Hochschule Kempten
Erasmus+
HELHa
Southern New Hampshire University
FANSHAWE
TUTE

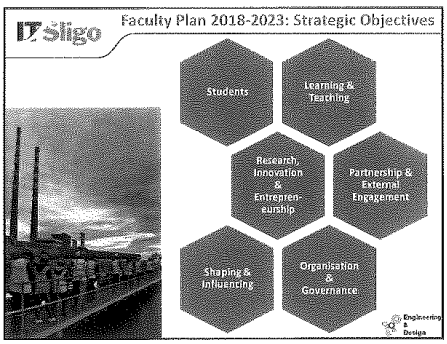
IT Sligo
Industry & Professional Links
Valeo
glanbia
Irish Medtech Association
ENGINEERS IRELAND
First Polymer Training
SOCIETY OF CHARTERED SURVEYORS IRELAND
Abbott
Regional Skills
NORTH WEST
Partnerships for Skills
Google
cisco
Microsoft
abbvie
CIOB
avenue
facebook
LASNTG
ABBEY THEATRE
AMHARCLANN NA MAINISTREACH
RIBA
Royal Institute of British Architects
UISCE EIREANN WATER
LiveTiles
INSTITUTE DESIGNERS IRELAND
RIAI

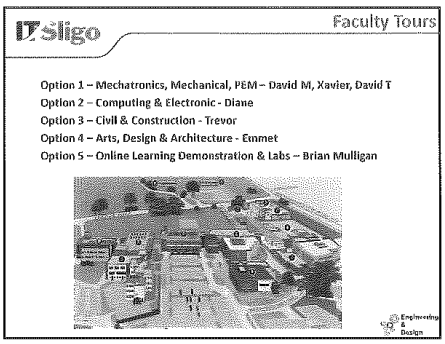

IT Sligo
IT Sligo MOOC Registrations - 2013 – 2018
10,000* students registered from 58 Countries
IT Sligo Lean Sigma MOOC Registrations
2013 - 2018

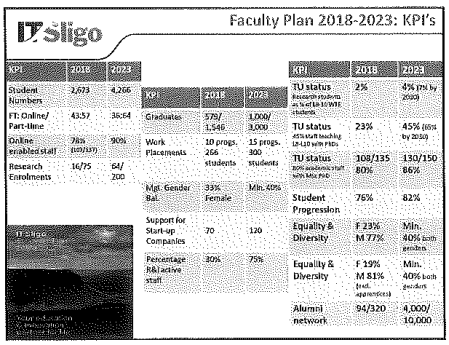
IT Sligo
Faculty Plan
2018-2023


Faculty Plan 2018-2023: Vision & Mission
Faculty of Engineering & Design
Vision
A leading Faculty of creative, innovative and technological education
Mission
To be regionally inspired and globally recognized in delivering sustainable, accessible and forward-looking education programmes. Through unique collaborations that build on our traditions, we produce graduates that are capable of leading the development of the region and beyond
Engineering & Design


Lunch Guests with Panel
Industry
Brendan O'Connor, Clanwilliam/ Socrates
Barry Kilfeather, Abbott
Graduates
Przemyslaw Raiwa, Rhatigan Architects
Katie Morris, E3
Konrad Mulrennan, PEM SRC
Engineering & Design

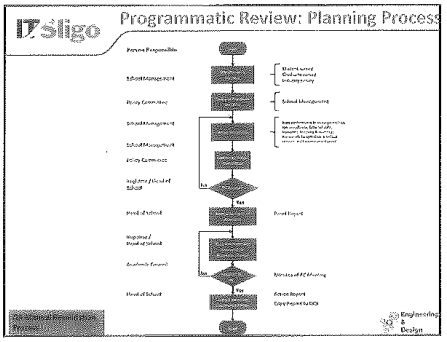

Faculty Plan 2018-2023: Strategic Objectives
Students
Learning & Teaching
Research, Innovation & Entrepreneurship
Partnership & External Engagement
Shaping & Influencing
Organisation & Governance
Engineering & Design

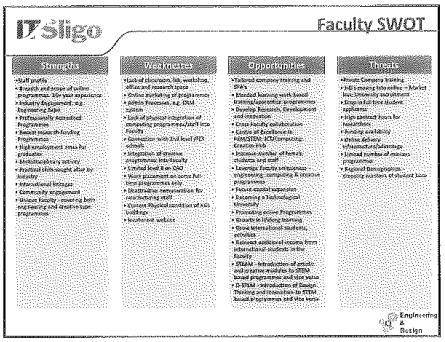

Faculty Tours
Option 1 – Mechatronics, Mechanical, PEM – David M, Xavier, David T
Option 2 – Computing & Electronic - Diane
Option 3 – Civil & Construction - Trevor
Option 4 – Arts, Design & Architecture - Emmet
Option 5 – Online Learning Demonstration & Labs – Brian Mulligan
Engineering & Design

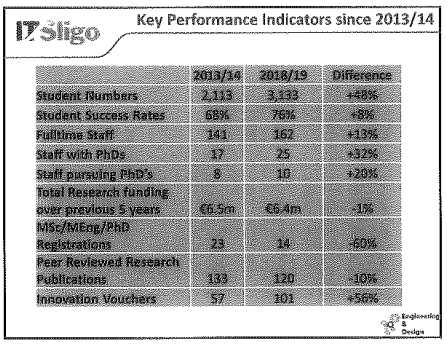

Faculty Plan 2018-2023: KPI's
KPI | 2018 | 2023
Student Numbers | 2,673 | 4,266
FT: Online/ Part-time | 43:57 | 36:64
Online enabled staff | 78% (107/137) | 90%
Research Enrolments | 16/75 | 64/ 200
KPI | 2018 | 2023
Graduates | 579/ 1,546 | 1,000/ 3,000
Work Placements | 10 progs. 266 students | 15 progs. 300 students
Mgt. Gender Bal. | 33% Female | Min. 40%
Support for Start-up Companies | 70 | 120
Percentage R&I active staff | 30% | 75%
KPI | 2018 | 2023
TU status Research students as % of Lab 10 WTE students | 2% | 4% (7% by 2030)
TU status 45% staff teaching LA-LO with PhDs | 23% | 45% (65% by 2030)
TU status 80% academic staff with MSc PhD | 108/135 80% | 130/150 86%
Student Progression | 76% | 82%
Equality & Diversity | F 23% M 77% | Min. 40% both gender
Equality & Diversity | F 19% M 81% (incl. apprentices) | Min. 40% both gender
Alumni network | 94/320 | 4,000/ 10,000

Big enough to innovate, small enough to care
Engineering & Design

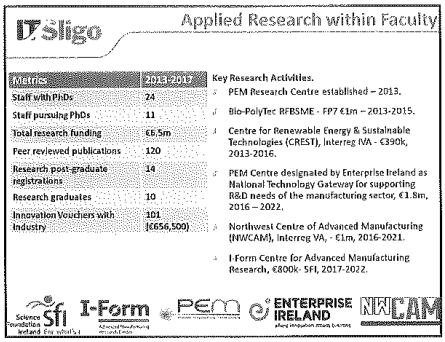
4



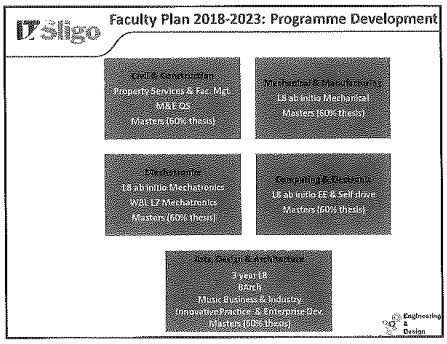


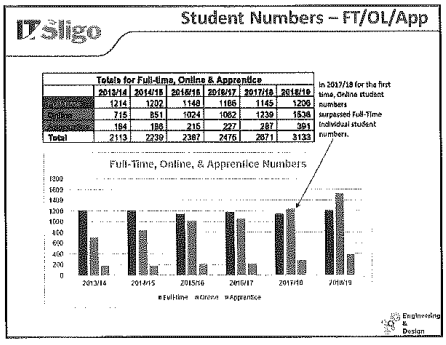


	2013/14	2018/19	Difference
Student Numbers	2,113	3,133	+48%
Student Success Rates	68%	76%	+8%
Fulltime Staff	141	162	+13%
Staff with PhDs	17	25	+32%
Staff pursuing PhD's	8	10	+20%
Total Research funding over previous 5 years	€6.5m	€6.4m	-1%
MSc/MEng/PhD Registrations	23	14	-60%
Peer Reviewed Research Publications	133	120	-10%
Innovation Vouchers	57	101	+56%



Metrics	2013-2017
Staff with PhDs	24
Staff pursuing PhDs	11
Total research funding	€6.5m
Peer reviewed publications	120
Research post-graduate registrations	14
Research graduates	10
Innovation Vouchers with Industry	101 (€656,500)





Totals for Full-time, Online & Apprentice						
	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Full-time	1214	1202	1148	1186	1145	1206
Online	715	851	1024	1062	1239	1536
Apprentice	184	186	215	227	287	391
Total	2113	2239	2387	2476	2671	3133

Student Numbers by Department

Registered Individual Student Numbers by Year/Department						
	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Civil & Const.	442	392	526	431	513	578
Mech. & Manu.	350	437	483	583	592	694
Mechatronics	405	376	384	394	432	553
Comp. & Electr.	526	628	571	647	623	575
A.D. & A.	320	288	284	287	279	330
Apprentices	184	160	215	227	287	391
Research	18	12	10	13	12	16
Total	2245	2317	2453	2482	2738	3133
WWTE Total	2,000	2,623	2,839	2,760	2,911	3,280

Registered Individual numbers by Year/Department

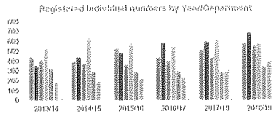
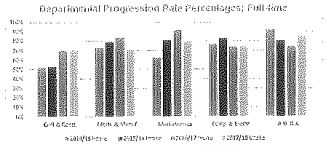


Figure 1. Registered Individual numbers by year and Department (WWTE Total) and Total Number of Students (WWTE Total)

Student Progression

Departmental Progression Percentages Full-time				
	2013/14 Intake	2014/15 Intake	2015/16 Intake	2017/18 Intake
Civil & Const.	52%	63%	70%	71%
Mech. & Manu.	73%	79%	83%	71%
Mechatronics	63%	81%	92%	79%
Comp. & Electr.	77%	83%	74%	74%
A.D. & A.	92%	80%	74%	85%
Avg. Faculty Prog'ss.	66%	74%	80%	74%

Departmental Progression Rate Percentages; Full-time



Student Numbers by Level

Registered Students by Calendar Year and Level					
	2013/14	2014/15	2015/16	2016/17	2017/18
Level 6	271	154	188	230	221
Level 7	1150	1253	1297	1313	1422
Level 8	506	550	614	629	685
Level 9	143	78	133	77	117
Level 10	7	6	6	6	6
Total	2076	2041	2238	2255	2451

Registered Students by Year and Level

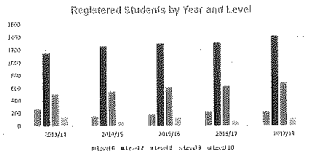


Figure 2. Total Registered Students by year and Level (WWTE Total) and Total Number of Students (WWTE Total)

Student Success Rates

Average Success Rates by Department per Year					
	2013/14	2014/15	2015/16	2016/17	2017/18
Civil & Const.	64%	70%	52%	65%	74%
Mech. & Manu.	65%	75%	69%	67%	69%
Mechatronic	67%	70%	71%	66%	68%
Comp. & Elec.	54%	72%	67%	69%	66%
A.D. & A.	88%	77%	81%	79%	82%
Avg. Faculty Success Rate	69%	73%	68%	69%	72%

Average Success Rates by Department per Year

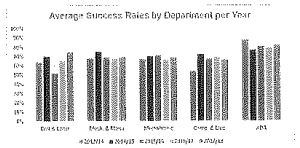


Figure 3. Average Success Rates by Department per Year (WWTE Total) and Average Success Rates by Department per Year (Apprentices) and Average Success Rates by Department per Year (Total Number of Students)

Student Numbers by Gender

Faculty Percentages of Male and Female Students per Year					
	2013/14	2014/15	2015/16	2016/17	2017/18
Male	18%	17%	18%	17%	16%
Female	82%	83%	82%	83%	84%

Faculty Percentages of Male and Female Students per Year

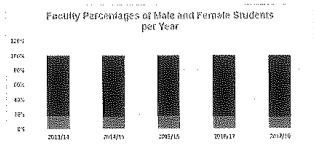


Figure 4. Registered Students Numbers by year by gender (WWTE)

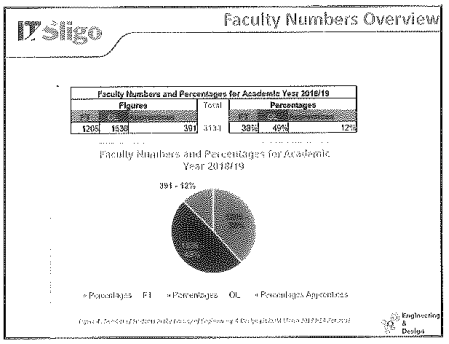
Academic Staff Qualifications

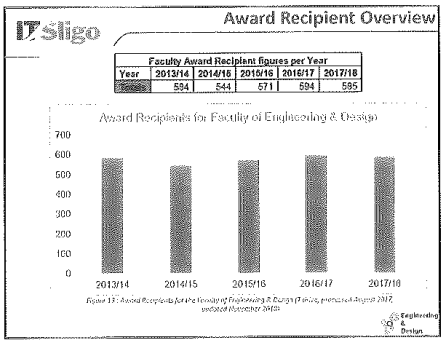
Faculty of Engineering & Design Staff Qualifications per Department						
	Civil & Const.	Mech. & Manu.	Mechatronics	Comp. & Electr.	Apprentices	Subtotal
Level 6	7	4	2	3	8	24
Level 7	22	11	21	7	25	86
Level 8	5	8	4	3	6	26
Total	34	23	27	13	38	135

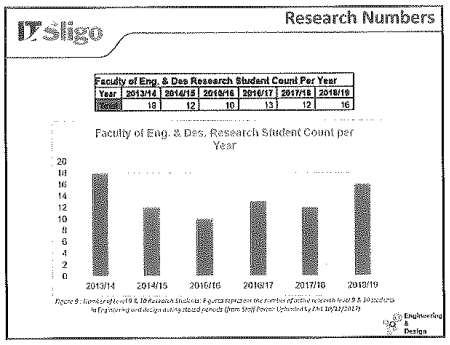
Faculty of Engineering & Design Staff Qualifications Percentages per Department						
	Civil & Const.	Mech. & Manu.	Mechatronics	Comp. & Electr.	Apprentices	Average
Level 6	21%	17%	7%	23%	21%	18%
Level 7	65%	48%	78%	54%	66%	62%
Level 8	15%	35%	15%	23%	13%	20%

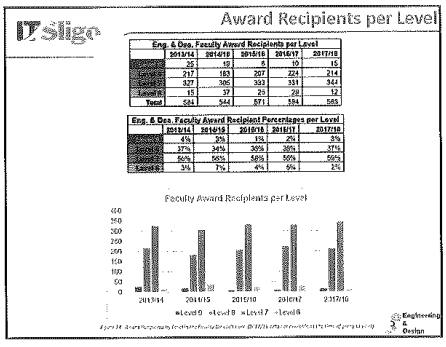
Qualifications of Academic Staff in Faculty of Engineering & Design

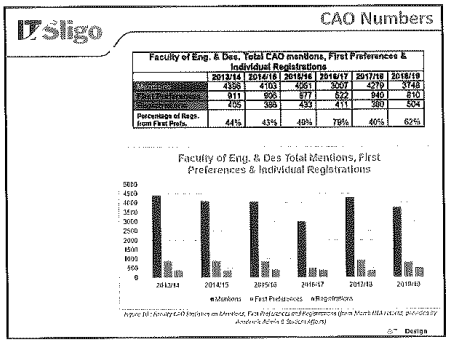
6

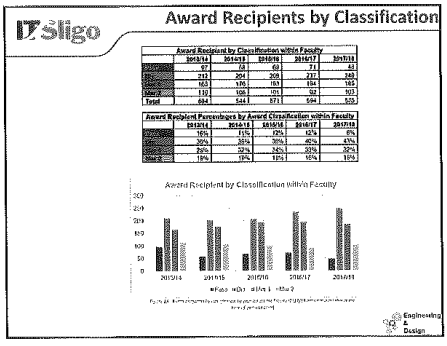

Sligo
Faculty Numbers Overview
Faculty Numbers and Percentages for Academic Year 2018/19
Figures
Total
Percentages
1205 1538 391 3134 38% 49% 12%
Faculty Numbers and Percentages for Academic Year 2018/19
391 - 12%
Percentages FT Percentages OL Percentages Apprentices
Engineering & Design

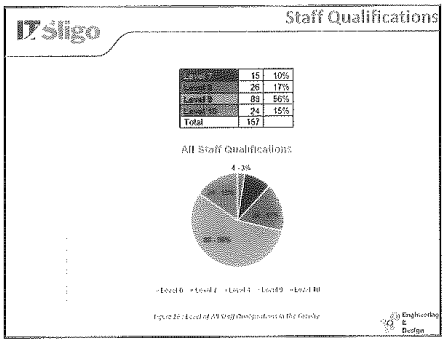

Sligo
Award Recipient Overview
Faculty Award Recipient figures per Year
Year 2013/14 2014/15 2015/16 2016/17 2017/18
Totals 584 544 571 594 585
Award Recipients for Faculty of Engineering & Design
700
600
500
400
300
200
100
0
2013/14 2014/15 2015/16 2016/17 2017/18
Engineering & Design

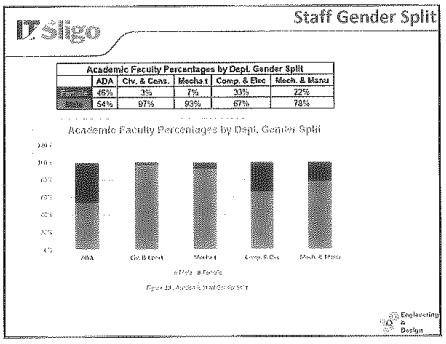

Sligo
Research Numbers
Faculty of Eng. & Des Research Student Count Per Year
Year 2013/14 2014/15 2015/16 2016/17 2017/18 2018/19
Total 18 12 10 13 12 16
Faculty of Eng. & Des. Research Student Count per Year
20
18
16
14
12
10
8
6
4
2
0
2013/14 2014/15 2015/16 2016/17 2017/18 2018/19
Engineering & Design

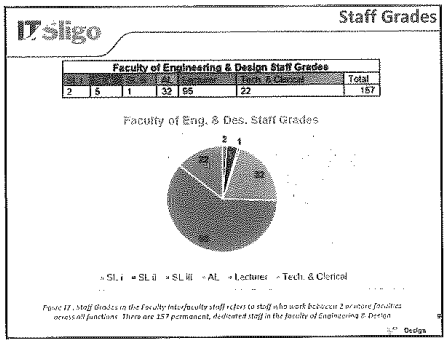

Sligo
Award Recipients per Level
Eng. & Des. Faculty Award Recipients per Level
2013/14 2014/15 2015/16 2016/17 2017/18
Level 9 25 19 8 10 15
Level 8 217 183 207 224 214
Level 7 327 305 333 331 344
Level 6 15 37 23 29 12
Total 584 544 571 594 585
Eng. & Des. Faculty Award Recipient Percentages per Level
2013/14 2014/15 2015/16 2016/17 2017/18
Level 9 4% 3% 1% 2% 3%
Level 8 37% 34% 36% 38% 37%
Level 7 56% 56% 58% 56% 59%
Level 6 3% 7% 4% 5% 2%
Faculty Award Recipients per Level
2013/14 2014/15 2015/16 2016/17 2017/18
Level 9 Level 8 Level 7 Level 6
Engineering & Design

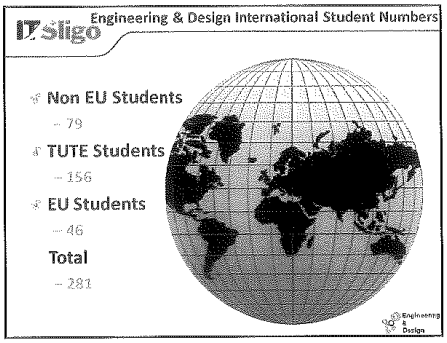

Sligo
CAO Numbers
Faculty of Eng. & Des. Total CAO mentions, First Preferences & Individual Registrations
2013/14 2014/15 2015/16 2016/17 2017/18 2018/19
Mentions 4396 4103 4051 3007 4279 3748
First Preferences 911 906 877 522 940 810
Registrations 405 386 433 411 380 504
Percentage of Regs. from First Prefs. 44% 43% 49% 79% 40% 62%
Faculty of Eng. & Des Total Mentions, First Preferences & Individual Registrations
2013/14 2014/15 2015/16 2016/17 2017/18 2018/19
Mentions First Preferences Registrations
Design

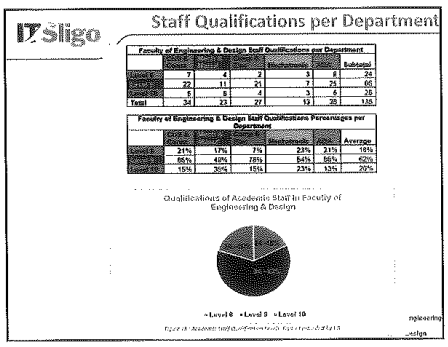

Sligo
Award Recipients by Classification
Award Recipient by Classification within Faculty
2013/14 2014/15 2015/16 2016/17 2017/18
Total 584 544 571 594 585
Award Recipient Percentages by Award Classification within Faculty
2013/14 2014/15 2015/16 2016/17 2017/18
Award Recipient by Classification within Faculty
2013/14 2014/15 2015/16 2016/17 2017/18
Engineering & Design

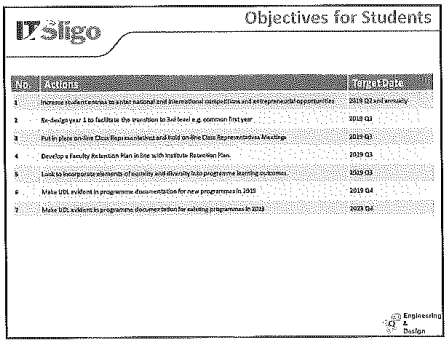

Staff Qualifications
15 10%
26 17%
83 56%
24 15%
Total 157
All Staff Qualifications


Staff Gender Split
Academic Faculty Percentages by Dept. Gender Split
ADA Civ. & Cons. Mecha t Comp. & Elec Mech. & Manu
Male 54% 97% 93% 67% 78%
Academic Faculty Percentages by Dept. Gender Split


Staff Grades
Faculty of Engineering & Design Staff Grades
SL I SL II SL III AL Lecturers Tech. & Clerical Total
2 5 1 32 65 22 157
Faculty of Eng. & Des. Staff Grades
SL I SL II SL III AL Lecturers Tech. & Clerical


Engineering & Design International Student Numbers
Non EU Students
79
TUTE Students
156
EU Students
46
Total
281


Staff Qualifications per Department
Faculty of Engineering & Design Staff Qualifications per Department
Faculty of Engineering & Design Staff Qualifications Percentages per Department
Qualifications of Academic Staff in Faculty of Engineering & Design
Level 8 Level 9 Level 10


Objectives for Students
No. Actions Target Date
1 Increase student success in wider national and international competitions and entrepreneurial opportunities 2019 Q2 and annually
2 Re-design year 1 to facilitate the transition to 3rd level e.g. common first year 2018 Q3
3 Put in place on-line Class Representatives and hold on-line Class Representatives Meetings 2019 Q1
4 Develop a Faculty Retention Plan in line with Institute Retention Plan. 2019 Q1
5 Look to incorporate elements of mobility and diversity into programme learning outcomes. 2019 Q3
6 Make UDL evident in programme documentation for new programmes in 2019 2019 Q4
7 Make UDL evident in programme documentation for existing programmes in 2019 2019 Q4

Objectives for Learning & Teaching

No.	Actions	Target Date
1	Develop a Faculty Space Utilisation plan	2018 Q3
2	Achieve accreditation of appropriate programmes with CIOB, RIBA, SCSI, RIAI, Engineers Ireland	2019 Q2
3	Introduce programmes/modules, where appropriate, with related industry certifications, e.g. Navanod Instruments, ASD, Rob, Stratasys/ABS, Cisco CCNA	2019 Q2
4	Provide formal and informal meetings and student project spaces - each programme to have access to these spaces	2019 Q3
5	Introduce more multidisciplinary/vertical projects into programmes on a Faculty wide level	2019 Q3

Objectives for Shaping & Influencing Economic, Social & Cultural Development

No.	Actions	Target Date
1	Create a database of key influencing bodies and contacts linked to Faculty of Engineering & Design	2018 Q4
2	Develop and maintain a database of faculty staff that participate in influencing bodies	2018 Q4
3	Programmes will publically reconsolidate behaviour competencies into the curriculum	2019 Q3 & Ongoing
4	Each programme to have at least one student project based on a need from a community organisation/voluntary group.	2019 Q4

Objectives for Research, Innovation & Entrepreneurship

No.	Actions	Target Date
1	Establish a research group in Civil, Structural and Environmental Engineering	2019 Q4
2	Implement a structured PhD programme in line with University PhD requirements by mid-2019	2019 Q3
3	Establish a research group in Mechanical Engineering	2019 Q4
4	Use PhD supervision to increase capacity in Civil, Structural and Environmental Engineering and Mechanical Engineering	2019 Q2 and Ongoing
5	Establish a research group in Architecture	2019 Q4
6	Establish a Research Centre in Architecture	2019 Q4
7	Develop a Faculty Strategy for Research, Innovation and Entrepreneurship	2019 Q4
8	Establish a research group in Building Services Engineering	2020 Q1
9	Establish an industrial liaison committee in Mechanical Engineering	2020 Q1
10	Establish a research group in Building Information Modelling	2020 Q2
11	Develop a Faculty Strategy for Research, Innovation and Entrepreneurship	2020 Q2
12	Establish a research group in Architectural Technology	2020 Q2

Objectives for Organisation & Governance

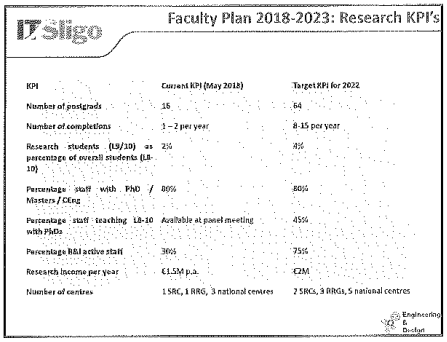
No.	Actions	Target Date
1	Agree dates of programme boards at the beginning of the year for faculty meetings and policy committee meeting	2018 Q4
2	Consider the concept of 'green' in the core curriculum as part of Programmatic Review	2019 Q3
3	Provide a buddy system for new final and part-time staff	2019 Q1
4	Improve 1 new domain of faculty business processes per year	2019 Q1 Pilot
5	Participation in Athena Swan project	

Objectives for Partnership & External Engagement

No.	Actions	Target Date
1	Organise an industry liaison group	2018 Q4 & Annually
2	Number of academic staff visiting schools- 10 schools per semester.	2018 Q4 & Annually
3	Ensure 3 departments is using the CRM that captures company linkages	2019 Q2
4	Develop 1 MOU with 2nd level/ETBs per year for faculty - link with Registrar's Office to ensure coordination	2018 Q2 & Annually
5	Incorporate a volunteerism initiative or assignment in all Faculty full-time programmes through the programmatic review.	2019 Q3
6	Ensure all functions are using the CRM that captures company linkages	2022 Q2

Faculty Plan 2018-2023: Development Themes

- Research Development and Innovation
- Work Placement, Work-based Learning)and Apprenticeships
- Transform Existing Buildings to support Centres of Excellence
- Diversity
- Internationalisation
- Increase cross department and cross faculty collaboration
- Technological University and CU Alliance
- Social responsibility
- Modes of learning
- Student recruitment and retention
- Strengthen our regional connections



IT Sligo

Faculty Plan 2018-2023: Research KPI's

KPI	Current KPI (May 2018)	Target KPI for 2022
Number of postgrads	16	64
Number of completions	1 – 2 per year	8-15 per year
Research students (L9/10) as percentage of overall students (L8-10)	2%	4%
Percentage staff with PhD / Masters / CEng	80%	80%
Percentage staff teaching L8-10 with PhDs	Available at panel meeting	45%
Percentage R&I active staff	36%	75%
Research income per year	€1.5M p.a.	€2M
Number of centres	1 SRC, 1 RRG, 3 national centres	2 SRCs, 3 RRGs, 5 national centres

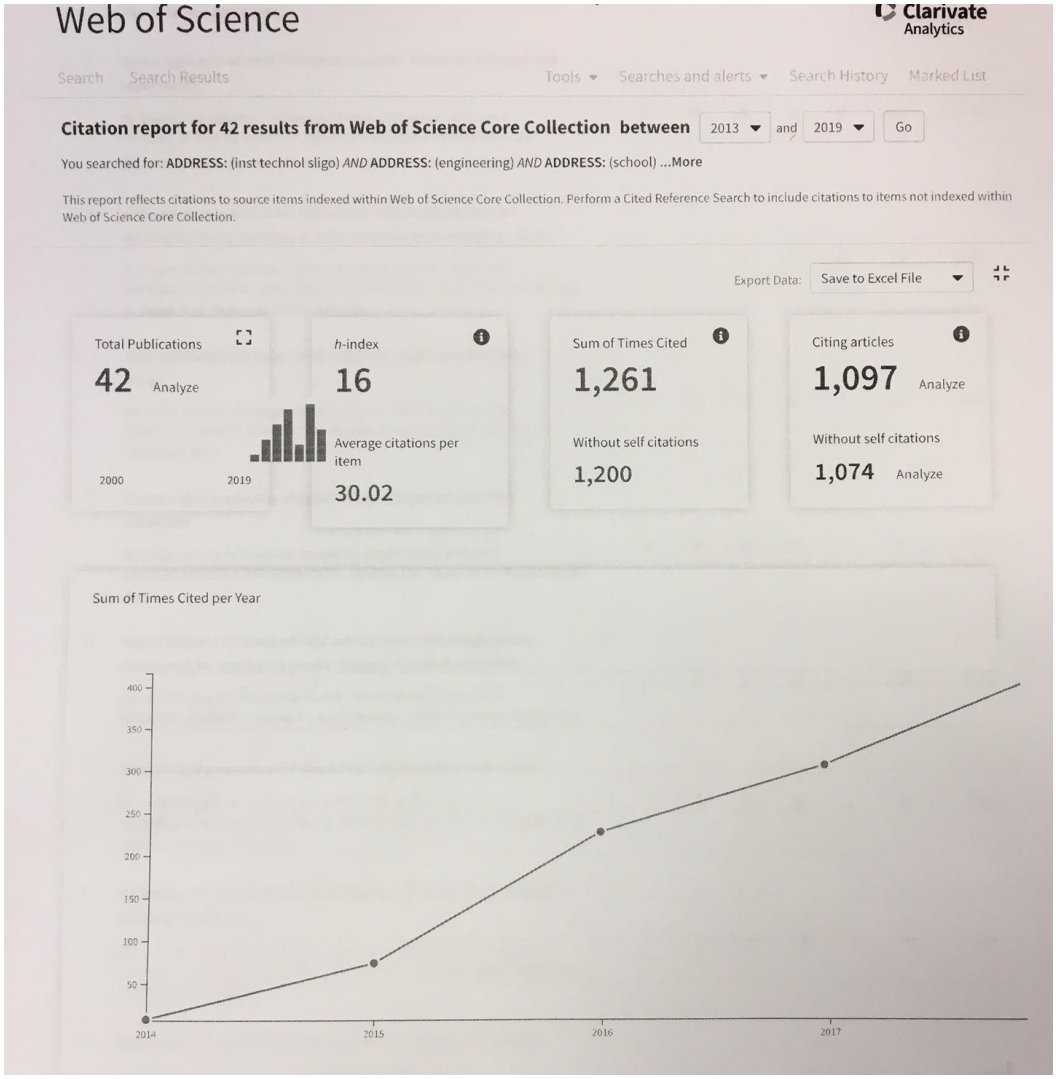
Engineering & Design

Addendum to Faculty of Engineering submission: research focus

Summary (2013-2018)

PEM Activities	Targets Achieved
Peer reviewed publications submitted/accepted	**127**
Company/Research Centre visits	**140**
Research proposals submitted	**62**
Innovation Vouchers	**140**
Networking/Dissemination events	**52**
No of Master/PhD completions to graduation	**3**
No. Master/PhD recruitments	**9**
Number of postdoc and technical staff recruited	**10**
Research Income (see next table)	**€5,714,583**
Citation Index	**16**

Citation Index from Web of Science from 2013



Previous Funded Projects from 2013

Grant Scheme	**Project Title**	**PEM Principal Investigators**	**Start Date**	**Finish Date**	**Grant Total**
Horizon 2020 Submitted 2018	EU-PANI-WATER	Prof Suresh Pillai	02/2019	01/2023	€3.7m *IT Sligo Budget: €269k*
SFI Centre's Programme	I-Form – Advanced Manufacturing Research Centre Spoke Project with Industrial Partner Abbvie 16/RC/3872	Dr. David Tormey Dr. Marion McAcfee Dr. Gerard McGranaghan	01/2018	3112/24	€18.6m (€700k IT Sligo budget)
Enterprise Ireland – Technology Gateway Programme	Precision Engineering and Materials Technology Gateway. TG-2017-1015	All PEM PIs	01/01/18	31/12/22	€1,404,777
Interreg V – Objective Priority Axis 1.1	Northwest Centre for Advanced Manufacturing INT-VA/047 Industrial Partners: Abbott GSK.	Dr. David Tormey Dr. John Donovan Dr. Richard Sherlock	04/2017	31/12/2021	€8.5m (IT Sligo Budget €946,492)
Total Active Funding					**€3.32m**

Current Funded Projects

	Grant Scheme	Project Title	PEM Principal Investigators	Project Partners	Status	Grant Total
1	Presidents Bursary Granted 2018	Additive Manufacture of "Enhanced Heat Transfer Surfaces" (ADMEHTS)	Dr. Gerard McGranaghan Dr. David Tormey	TCD, University of Manchester	Successful	€66k
2	Polish Academy of Science Granted 2018	Biological study and mathematical modelling to describe and predict new processes controlling the development, function and atresia of ovarian follicles in cows	Dr. Leo Creedon Dr. Marion McAfee	Polish National Science Centre (OPUS)	Successful	€458k
3	Various Institute Capacity fund awards Granted 2018	Supporting various PEM Research Projects	Dr. Leo Creedon Dr. David Tormey Dr. John Donovan Dr. Richard Sherlock	GSK, Abbott.	Successful	€20,475
4	SFI Granted 2018	SFI Discover Application for 'Sligo Engineering Fair'	Dr. Marion McAfee	I-Form Smart Labs, UCD, Engineers Ireland, Syndic8	Successful	€34k
5	Enterprise Ireland Innovation Partnership Feasibility IP-2017-0555-Y Granted 2017	Scoping of the Development of the Diagnostic Hub	Dr. David Tormey	Company: Union Health Technologies	Successful	€11,700

6	Enterprise Ireland Innovation Partnership Feasibility IP-2017-0549-Y Granted 2017	Develop Thermal Bridge Free Composite Aluminium Solutions for Low Energy and Sustainable Building Market.	Dr. David Tormey	Company: Glenfarne Wood Products	Successful	€11,700
7	Enterprise Ireland Innovation Partnership Feasibility IP/2017/550/Y Granted 2017 Co- Principal Investigator with PMTC UL.	Pilot Study into a viscosity soft sensor with application to pharmaceutical mixing processes	Dr. David Tormey Sean Mullery	GSK	Successful	€5,850
8.	Enterprise Ireland – Technology Gateway Granted 2016	Precision Engineering and Manufacturing Technology Gateway	Dr. David Tormey Dr. Marion McAfee Prof Suresh Pillai Dr. John Donovan Dr. Richard Sherlock	Various Industry	Successful 01/01/16 to 31/12/17	€360k
9.	H2020: SFERA Travel grant	Graphene-Semiconductor nano-composites for water disinfection applications	Prof. Suresh Pillai	PSA- Almeria	Funded	€10,000
10.	Direct industry funding	Anti-bacterial studies	Prof. Suresh Pillai	KASTUS Ltd, Ireland	Funded	€5,000
11.	IT Sligo President's Bursary 2015	Development of a Design Platform for the Manufacture of Nano-fibrous Chitosan and Graphene Composites for Bio-Medical Applications	Dr Ailish Breen, Dr Marion McAfee, Dr Suresh Pillai	N/A	Funded	€66,000
12.	FP7- Benefit of SMEs	Enhanced Process Monitoring and Control Technology	Dr. Marion McAfee Dr. Darren Whitker	QUB (RTD) – Belfast	Funded	€1,001,858

	Granted 2013	to Accelerate Development of Bioresorbable Polymeric Medical Devices (Bio-PolyTec)	Dr. David Tormey	TUT (RTD) – Finland Scaffdex (SME) – Finland IPC (SME) - Ireland FOS (SME) – Germany		
13.	SFI-EI-TIDA Granted 2013	Development of low cost, near infrared (NIR) reflective and very low thermal conductivity advanced materials for energy efficient thermal insulations	Professor Suresh Pillai	FSW Coatings – Cavan Dublin Institute of Technology	Funded	€95,000
14.	DSA – Design of Services for Alzheimer's Interreg IV Granted 2013	Supporting Public Service Innovation using Design in European Regions (SPIDER)	Dr. Linzi Ryan Dr. John Bartlett Dr. David Tormey	Geel City Council - Flanders Cardiff Metropolitan University / PDR- Wales Cardiff Council – Wales Seine-Maritime County Council – France Design Flanders – Flanders Maaslands Huis – Belgium VVSG – Flanders BMW Assembly – Ireland Partas - Ireland	Funded 01/01/2013 36 Months	€2.17M (*IT Sligo budget: €117k*
15.	**IT Sligo** President Bursary Granted 2013	Manufacturing Control and Optimisation using Simulation and Statistical Modelling	Dr. John Donovan Dr. David Tormey	Masonite Stiefel- GSK	Funded	66k
16.	**IT Sligo** President Bursary	Understanding the mechanism of Anatase to Rutile transition in	Professor Suresh Pillai	N/A	Successful	66k

	Granted	nanostructured titanium dioxide.				
						€2,394,583

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2. Stability studies of CdS sensitized TiO_2 nanotubes prepared using the SILAR method. Kalarivalappil, Vijila, Steven J. Hinder, **Suresh C. Pillai**, V. Kumar, and Baiju Vijayan. *Journal of Environmental Chemical Engineering,* 6, **2018**, 1404-1413.

3. An *in vitro* cytotoxicity assessment of graphene nanosheets on alveolar cells. Saoirse Dervin, James Murphy, Ruth Aviles, **Suresh C. Pillai,*** and Mary Garvey. *Applied Surface Science,* 434, **2018**, 1274-1284.

4. CuNPs decorated molecular imprinted polymer on MWCNT for the electrochemical detection of l-DOPA." Sooraj, M. P., Archana S. Nair, **Suresh C. Pillai**, Steven J. Hinder, and Beena Mathew, *Arabian Journal of Chemistry* (2018). https://doi.org/10.1016/j.arabjc.2018.06.002

5. Plasmonic-based nanomaterials for environmental remediation, *Applied Catalysis B: Environmental* Wang, Dawei, **Suresh C. Pillai**, Shih-Hsin Ho, Jingbin Zeng, Yi Li, and Dionysios D. Dionysiou. 237 (2018): 721-741.

6. Advances in catalytic/photocatalytic bacterial inactivation by nano Ag and Cu coated surfaces and medical devices."), Rtimi, Sami, Dionysios D. Dionysiou, Suresh C. Pillai, and John Kiwi.*Applied Catalysis B: Environmental* (2018), In Press

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9. Antimicrobial Activity of Photocatalysts: Fundamentals, Mechanisms, Kinetics and Recent Advances Ganguly, Priyanka, Ciara Byrne, Ailish Breen, **Suresh C. Pillai*** *Applied Catalysis B: Environmental,* 225, **2018***,* 51-75.

10. Recent advances in Photocatalytic Detoxification of water; Nanoscale Materials in Water Purification, Ganguly, P., Panneri, S., Hareesh, U. N. S., Breen, A., & **Suresh C. Pillai** (2018). **ISBN:** 9780128139264 (Book Chapter: Publisher: *Elsevier*.)

11. Recent Advances in Photocatalysis for Environmental Applications. Ciara Byrne, Gokulakrishnan Subramanian, and **Suresh C. Pillai*** *Journal of Environmental Chemical Engineering* , **2018**. https://doi.org/10.1016/j.jece.2017.07.080

12. Advances in the Development of Novel Photocatalysts for Detoxification (Book Chapter), Ciara Byrne Michael Nolan, Swagata Banerjee, Honey John, Sheethu Jose, Pradeepan Periyat and **Suresh C. Pillai**,* *Visible-Light-Active Photocatalysis: Nanostructured Catalyst Design, Mechanisms, and Applications.*Published by Wiley-VCH Verlag Gmbh & Co. KGaA, Germany.**2018**, **ISBN**: 978-3-527-34293-8

13. Catalysis for Environmental Applications. Han, Changseok, Endalkachew Sahle-Demessie, Afzal Shah, Saima Nawaz, Niall B. Latif-ur-Rahman, Suresh C. Pillai, Hyeok Choi, Dionysios D. Dionysiou, and Mallikarjuna N. Nadagouda. *Sustainable Catalysis: Energy-Efficient Reactions and Applications,* **2018,** 207-230.

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15. Graphene oxide reinforced high surface area silica aerogels, Saoirse Dervin, Yvonne Lang, Tatiana Perova, Steven H Hinder, **Suresh C Pillai*,** *Journal of Non-Crystalline Solids,* **2017**, 465, 31-38.

16. Solar photocatalytic disinfection of ***E. coli*** and *bacteriophages* MS2, ΦX174 and PR772 using TiO_2, ZnO and ruthenium based complexes in a continuous flow system, Joanne Mac Mahona, **Suresh C. Pillai**, John M. Kelly, Laurence W. Gill, *Journal of Photochemistry & Photobiology, B: Biology* **2017**, 170, 79–90.

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18. An Introduction to Sol Gel Processing for Aerogels, Saoirse Dervin and **Suresh C. Pillai,*** *Book chapter in the book, Sol gel Materials for Energy, Environment and Electronic Applications.* Publisher: Springer, **2017**, **ISBN** 978-3-319-50142-0

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21. Konrad Mulrennan, **John Donovan, Leo Creedon**, Ian Rogers, John G. Lyons, **Marion McAfee**, A soft sensor for prediction of mechanical properties of extruded PLA sheet using an instrumented slit die and machine learning algorithms, *Polymer Testing*, 2018, https://doi.org/10.1016/j.polymertesting.2018.06.002

22. Darren A. Whitaker, Fraser Buchanan, Mark Billham, **Marion McAfee**, A UV-Vis spectroscopic method for monitoring of additive particle properties during polymer compounding, *Polymer Testing*, Vol. 67, pp392-398, 2018. https://doi.org/10.1016/j.polymertesting.2018.03.030

23. Konrad Mulrennan, Fraser Buchanan, Mark Billham, Thomas Smyth, **John Donovan, Leo Creedon** and **Marion McAfee**. Degradation profiles of Polylactide - A comparative study of machine learning soft sensors used for inline prediction. Polymer Processing Society conference in Cancun, Mexico from 10 – 14th December, 2017.

24. Konrad Mulrennan, Fraser Buchanan, Mark Billham, **John Donovan, Leo Creedon** and **Marion McAfee**. Developing a soft sensor Random Forest model for the inline product characterization of Polylactide (PLA) in a twin screw melt extrusion process. Presented at the ANTEC conference in Anaheim, USA from 8 – 10th May, 2017.

25. Mulrennan, K., **McAfee, M., Creedon, L., Donovan, J.,** Rogers, I., Lyons, S. "A Hybrid Soft Sensor Model for Predicting Mechanical Properties of Polylactide during Extrusion Processing", Proceedings of the 24th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland (BinI 2018) Enfield, Co. Meath Ireland, January 27, 2018.

26. Konrad Mulrennan, Fraser Buchanan, Mark Billham, **John Donovan, Leo Creedon** and **Marion McAfee**. Inline Product Characterization of Polylactide (PLA) during Melt Extrusion Processing using the Random Forest Algorithm. Presented at the SIAM conference in National University of Ireland, Galway on 26th May, 2017.

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5. Darren A. Whitaker, Konrad Mulrennan, Elina Talvitie, Inari Lyyra, Minna Kellomaki, Marion McAfee. *IN-SITU MONITORING OF THERMAL DEGRADATION DURING PRODUCTION OF PLA FIBRES FOR ORTHOPAEDIC IMPLANTS.* Presented at *15th Annual Research Conference, Sligo University Hospital*, Ireland, 2015

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27. Mulligan, S., Casserly, J., and **Sherlock, R**. (2016). "Effects of Geometry on Strong Free-Surface Vortices in Subcritical Approach Flows." *J. Hydraul. Eng.* , 10.1061/(ASCE)HY.1943-7900.0001194 , 04016051.

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1. Luminea **C, Donovan J, Tormey D**, *Application of Systems Simulation for Predicting and Optimising Energy Requirements for HDF Production*," Journal of Industrial Engineering, vol. 2015, Article ID 650925, 16 pages, 2015. doi:10.1155/2015/650925
2. Mole T, McDonald B, Mullery S, Diver C, **Tormey D,** *The Development of a Pulsed Power Supply for Micro Electrochemical Machining,* 18th CIRP Conference on Electro Physical and Chemical Machining (ISEM XVIII), University of Tokyo, Japan, April 2016.
3. Bartlett J, Gavin M, Tonry S, **Tormey D**, Fostering an Innovation Culture in SMEs in a Peripheral Region, International Conference on University-Industry Interaction, Berlin, Germany, June 2015
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5. Hydrothermal synthesis of ZnO decorated reduced graphene oxide: Understanding the mechanism of photocatalysis, Maheswari. K. Kavitha, **Suresh C. Pillai** , Pramod Gopinath, Honey John, *Environmental Chemical Engineering Journal*, **2015**, 3, 1194–1199.
6. Photocatalysis for Treating Contaminants and Microorganisms of Emerging Concern (Editorial), **Suresh C. Pillai,*** ***Urška Lavrenčič Štangar,*** John A. Byrne, Alejandro Pérez Larios**,** and Dionysios D. Dionysiou, *Chemical Engineering Journal*, **2015**,261, 1-2; *Impact Factor = 4.05*
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5. Kafil M. Razeeb, Joanna Podporska-Carroll, Mamun Jamal, Maksudul Hassan, Michael Nolan, Declan McCormack, Brid Quilty, Simon B. Newcomb, **Suresh C. Pillai**, *Antimicrobial properties of vertically alignednano-tubularcopper* Materials Letters, 2014, (In Press)

6. Donal A. Keane, Kevin G. McGuigan, Pilar Fernández Ibáñez, M. Inmaculada Polo-López, J. Anthony Byrne, Patrick S. M. Dunlop, Kevin O'Shea, Dionysios D. Dionysiou and **Suresh C. Pillai,*** *Solar photocatalysis for water disinfection: Materials and reactor design*, RSC Catal. Sci. Technol., 4, 2014, 1211- 1226. (This work was supported by SFI-US-Ireland Project).

7. P. Suyana S. Nishanth Kumar, B. S. Dileep Kumar, Balagopal N. Nair, **Suresh C. Pillai**, A. Peer Mohamed, K. G. K. Warrier and U. S. Hareesh, *Antifungal properties of nanosized ZnS particles 100unctional100 by sonochemical precipitation*, RSC Adv., 4, 2014, 8439-8445. (This work was supported by SFI-India-Ireland ISCA collaborative Project).

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9. Andrew Mills, James Hepburn, David Hazafy, Christopher O'Rourke, Nathan Wells, Josef Krysa, Michal Baudys, Martin Zlamal and Hana Bartkova, Claire E. Hill, Kim R. Winn, Morten E. Simonsen and Erik G. Søgaard, Swagata Banerjee, Rachel Fagan, ***Suresh C. Pillai***, *Photocatalytic Activity Indicator Inks for Probing a Wide Range of Surfaces*, Submitted to Journal of photochemistry Photobiology A., (Accepted). (This work was supported by FP7-NMP-CSA)

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11. **K. Mulrennan**, F. Buchanan, **M. McAfee**, 'Modelling and Control of Bioresorbable Polymer Processing', Bioengineering in Ireland (BINI) 20, Limerick, January 2014.

12. D. Lennon, M. McAfee, M.Billham, F. Buchanan, 'Establishing the Sensitivity of PLLA Bioresorbable Polymer to Thermal Degradation during Melt-Processing', Bioengineering in Ireland (BINI) 20, Limerick, January 2014

APPENDIX 5: Staff who met panel

Ms Una Parsons
Dr David Mulligan
Dr Xavier Velay
Ms Diane O Brien
Mr Emmet Doherty
Dr David Tormey
Mr. Trevor McSharry
Dr Brian McCann
Dr Said Huq
Mel Casserly
Kieran Gallagher
Gary McGinty
Dr David Collery
Jerome McElchar
Kathryn Ryan
Owen Feeney
Colin Birney
Daniel Clarke Hagan
Barrie Cox
Kathryn Ryan
Jerome McElchar
Paul Hamilton
Dr Pat Naughton
Dr Tomas O' Flathery
Bill O'Kelly Lynch
Fergal Gallagher
John Casserly
Caroline Mullan
Dr Molua Donohoe
Gerard McGranaghan
Sean Dalton
Robert Craig
Michael Moffatt
Mary Nolan
Declan Sheridan
Donal Lyons
Paul Ferry
Conall Doran
Brian Hanrahan
Eamonn Pric
Declan Sheridan
Dr John Donovan
Brian Coll
Caroline Mullan
Donal Cannon

Paul Curran
Noeleen Grant
Fiona Donovan
Mary Nolan
Mairead McCann
Rudie Coppieters
Meliosa O Brien
Rowan Watson
Claire Larusso
Elaine Regan
Peter Scanlon
Tom Weir
Dr Niall Rea
Dr Una Mannion
Dr Rhona Trench
Dr Agnes Pallai
Mary Byrne
Elizabeth Caffrey
Bernadette Donohoe
Denis Farrell
Hiliary Gilligan
Jacinta Feeney
John Graham
Seamus Grogan
Deirdre Greaney
Ronnie Hughes
Elizabeth Kinsella
Angela Mehegan
Louis Mc Manus
Mark Pepper
David Roberts
Michael Boulston
Fergal Henry
Louise O Gorman
Shane Gilroy
Adrian Durcan
Sean Mullery
Una L'Estrange
Neil Gannon
Colm Davey
Shaun Mc Brearty
Fiona Mitchell
Paul Connelly
Eva Murphy
Francis O Regan
Fabian Connolly
Ian Craig

Shane Banks
John Weir
Anna Mitchel
Keith Mc Manus
Drew Lang
Nevil Walsh
Diarmuid Timmons
Dr Paul Tansey
Paul Powell
Aine Mitchell
Padraig Harte
Marketa Formanova
Paul Donlon
Dr Marion McAfee
Kevin Collins
Dr John Hession

Appendix 6: **List of Student Representatives and External Stakeholders who met the Panel**

Elaine Murphy

Laura Hennigan

Ena Nic Dhonnach

Kate Morris

Sean Mc Inerney

Judith Toner

Niamh Mc Cabe

Tracey Powell

Mairin Dolan

Michael Duffy

Pauric Duffy

Nora Costello

Darren Rooney

Ronan O Callaghan

Eddie O Connor

Appendix 7 Academic Programmes recommended to the Academic Council by the Panel for revalidation

Department	Discipline	Programme Title
Arts, Design & Architecture	Architecture	Bachelor of Arts in Interior Architecture & Design (Ab-initio)
Arts, Design & Architecture	Architecture	Bachelor of Architecture (Honours) (Ab-initio)
Arts, Design & Architecture	Architecture	Bachelor of Arts (Honours) in Interior Architecture
Arts, Design & Architecture	Arts	Bachelor of Arts in Performing Arts (Acting) (Ab-initio)
Arts, Design & Architecture	Arts	Bachelor of Arts in Performing Arts (Theatre Design) (Ab-initio)
Arts, Design & Architecture	Arts	Bachelor of Arts (Honours) in Performing Arts (Ab-initio)
Arts, Design & Architecture	Arts	Bachelor of Arts (Honours) Writing and Literature (Ab-initio)
Arts, Design & Architecture	Arts	Bachelor of Arts in Fine Art (Ab-initio)
Arts, Design & Architecture	Arts	Bachelor of Arts (Honours) in Fine Art (Ab-initio)
Arts, Design & Architecture	Design	Bachelor of Arts in Creative Design (Ab-initio)
Arts, Design & Architecture	Design	Bachelor of Arts in Creative Design (Ab-initio)
Arts, Design & Architecture	Design	Bachelor of Arts (Honours) in Creative Design (Add-on)
Civil & Construction	Civil	Higher Certificate in Civil Engineering
Civil & Construction	Civil	Bachelor of Engineering in Civil Engineering (Ab-initio)
Civil & Construction	Civil	Bachelor of Engineering (Honours) in Civil Engineering (Add-on)
Civil & Construction	Civil	PhD in Civil Engineering
Civil & Construction	Civil	PhD in Environmental Engineering
Civil & Construction	Civil	Certificate in Science in Drinking Water Treatment Operations
Civil & Construction	Civil	Higher Certificate in Wastewater Treatment Operations
Civil & Construction	Civil	SPA Cert. in Engineering Road Network Management
Civil &	Civil	Masters of Engineering in Road and Transport Engineering

Construction		
Civil & Construction	Civil	Post Graduate Diploma in Road and Transport Engineering
Civil & Construction	Civil	Certificate in Road Maintenance Engineering and Network Management
Civil & Construction	Construction	Higher Certificate in Construction Economics
Civil & Construction	Construction	Bachelor of Science in Advanced Wood & Sustainable Building Technology (Ab-initio)
Civil & Construction	Construction	Bachelor of Science in Quantity Surveying (Ab-initio)
Civil & Construction	Construction	Bachelor of Science (Honours) in Quantity Surveying (Ab-initio)
Civil & Construction	Construction	Bachelor of Science (Honours) in Construction Project Management
Civil & Construction	Construction	Bachelor of Science (Honours) in Quantity Surveying (Add-on)
Civil & Construction	Construction	PhD in Construction Engineering
Civil & Construction	Construction	Certificate in BIM and Lean Construction Management (SPA)
Civil & Construction	Construction	Certificate in Construction Law, Procurement and Finance (SPA)
Civil & Construction	Construction	Certificate in Strategic Construction Management (SPA)
Civil & Construction	Construction	Higher Certificate in Construction Economics
Civil & Construction	Construction	Bachelor of Science (Honours) in Construction Project Management (Add-on)
Civil & Construction	Construction	Bachelor of Science in Quantity Surveying
Civil & Construction	Construction	Bachelor of Science (Honours) in Construction Project Management (Add-on)
Civil & Construction	Construction	Bachelor of Science (Honours) in Quantity Surveying (Add-on)
Civil & Construction	Construction	Masters of Science in Project Management
Civil & Construction	Construction	Postgraduate Diploma in Science in Project Management
Civil & Construction	Construction	SPA Certificate in Project Management
Computing & Electronic	Computing	Higher Certificate in Science in Computing undenominated
Computing & Electronic	Computing	Higher Cert in Computing
Computing & Electronic	Computing	Bachelor of Science in Computing in Computer Networks and Cloud Infrastructure (Ab-initio)

Computing & Electronic	Computing	Bachelor of Science in Computing in Computing (Ab-initio) non-denominated
Computing & Electronic	Computing	Bachelor of Science in Computing in Software Development (Ab-initio)
Computing & Electronic	Computing	Bachelor of Science in Computing
Computing & Electronic	Computing	Bachelor of Science in Computing in Games Development
Computing & Electronic	Computing	Bachelor of Science in Computing in Web Dev & Creative Design (Ab-initio)
Computing & Electronic	Computing	Bachelor of Arts (Honours) in Computing in Application Design and User Experience (Ab-initio)
Computing & Electronic	Computing	Bachelor of Science (Honours) in Computing in Computer Networks and Cloud Infrastructure (Ab-initio)
Computing & Electronic	Computing	Bachelor of Science (Honours) in Computing in Smart Technologies (Ab-initio)
Computing & Electronic	Computing	Bachelor of Science (Honours) in Computing in Software Development (Ab-initio)
Computing & Electronic	Computing	Bachelor of Science (Honours) in Computing in Software Development (Add-on)
Computing & Electronic	Computing	Bachelor of Science Degree (Honours) in Computing
Computing & Electronic	Computing	Higher Diploma in Science in Computing
Computing & Electronic	Computing	Bachelor of Science in Software Development (Add-on)
Computing & Electronic	Computing	Certificate in Computing in Computer Networks and Cloud Infrastructure
Computing & Electronic	Computing	Certificate in Software Development
Computing & Electronic	Computing	Bachelor of Science (Honours) in Computing in Software Development (Add-on)
Computing & Electronic	Electronic	Higher Certificate in Engineering in Engineering in Electronic and Computer Engineering
Computing & Electronic	Electronic	Higher Certificate in Electronic & Computer Engineering
Computing & Electronic	Electronic	Bachelor of Engineering in Electronic and Computer Engineering (Ab-initio)
Computing & Electronic	Electronic	Certificate in Engineering in Automation & Electronics
Computing & Electronic	Electronic	Bachelor of Engineering in Electronic Engineering (Add-on)

Computing & Electronic	Electronic	Certificate in Secure IT and Deep Machine Learning
Computing & Electronic	Electronic	Bachelor of Engineering (Honours) in Electronic & Computer Engineering (Add-on)
Computing & Electronic	Electronic	Certificate in Sensors for Autonomous Vehicles
Computing & Electronic	Electronic	Certificate in Automotive Artificial Intelligence
Computing & Electronic	Electronic	Postgraduate Diploma in Connected and Autonomous Vehicles
Computing & Electronic	Electronic	Masters of Engineering in Connected and Autonomous Vehicles
Mechanical & Manufacturing	Mechanical	Higher Certificate in Engineering in Precision Engineering & Design
Mechanical & Manufacturing	Mechanical	Higher Certificate in Mechanical Engineering
Mechanical & Manufacturing	Mechanical	Bachelor of Engineering in Mechanical Engineering (Ab-initio)
Mechanical & Manufacturing	Mechanical	Bachelor of Engineering in Precision Engineering and Design (Ab-initio)
Mechanical & Manufacturing	Mechanical	Bachelor of Engineering (Hons) in Mechanical Engineering (Add-on)
Mechanical & Manufacturing	Mechanical	Bachelor of Engineering (Honours) in Precision Engineering & Design (Add-on)
Mechanical & Manufacturing	Mechanical	Doctor of Philiosphy (Eng) in Manufacturing Engineering
Mechanical & Manufacturing	Mechanical	Doctor of Philosophy (Eng) in Mechanical Engineering
Mechanical & Manufacturing	Mechanical	Certificate in Engineering in Mechanical Analysis & Automation
Mechanical & Manufacturing	Mechanical	Bachelor of Engineering in Precision Engineering & Design (Add-on)
Mechanical & Manufacturing	Quality	Certificate Work Based Project (SPA)
Mechanical & Manufacturing	Quality	Certificate in Quality Assurance
Mechanical & Manufacturing	Quality	SPA in Validation Technologies
Mechanical & Manufacturing	Quality	Bachelor of Science in Manufacturing Management (Add-on)
Mechanical & Manufacturing	Quality	Bachelor of Science in Quality Engineering (Add-on)

Mechanical & Manufacturing	Quality	Certificate in Six Sigma Yellow Belt
Mechanical & Manufacturing	Quality	SPA Certificate in Engineering in Lean Sigma Quality
Mechanical & Manufacturing	Quality	Certificate in Advanced Lean Sigma Quality - Black Belt
Mechanical & Manufacturing	Quality	Certificate in Advanced Lean Sigma Quality Project - Black Belt
Mechanical & Manufacturing	Quality	Bachelor of Science (Honours) in Quality Management & Technology (Add-on)
Mechanical & Manufacturing	Quality	Master of Science in Quality
Mechatronic Engineering	Mechatronic	Higher Certificate in General Engineering
Mechatronic Engineering	Mechatronic	Higher Certificate in Mechatronic Engineering
Mechatronic Engineering	Mechatronic	Bachelor of Engineering in Mechatronics (Ab-initio)
Mechatronic Engineering	Mechatronic	Certificate in Engineering in Automation and Instrumentation
Mechatronic Engineering	Mechatronic	Bachelor of Engineering in Data Centre Facilities Engineering (Add-on)
Mechatronic Engineering	Mechatronic	Bachelor of Engineering in Mechatronics (Add-on)
Mechatronic Engineering	Mechatronic	Bachelor of Engineering (Honours) in Mechatronics (Add-on)
Mechatronic Engineering	Mechatronic	Bachelor of Engineering (Honours) in Mechatronics (Add-on)
Mechatronic Engineering	Polymer	Certificate in Polymer Technologies
Mechatronic Engineering	Polymer	BEng in Polymer Processing
Mechatronic Engineering	Polymer	Bachelor of Engineering in Polymer Processing (Add-on)
Mechatronic Engineering	Polymer	Bachelor of Engineering (Honours) in Polymer Processing (Online)