Faculty of STEM Quality Report 2021/22

Contents

FACULTY OF SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) EXECUTIVE SUMMARY

The STEM Faculty consists of eight schools. In the 2020/21 Faculty Quality report we reflected on the theme of 'togetherness' as we worked to implement the lessons learnt during the pandemic and to embed in-person and hybrid practices into our weekly operations. In 2021/22 the schools are 'actively reengaging' with their physical spaces; recognising that these are the sites for the peer-to-peer and staff interactions vital to imparting technical knowledge.

In 2021/22 two STEM schools underwent external review: Biochemistry and Immunology, and Genetics and Microbiology. The well-constructed reports and implementation plans are published and are a reflection of the work that went into the process. This will emerge as a repeating pattern (two STEM schools per academic year) for several years to come.

Athena SWAN and Gender equality
7/8 schools in STEM have attained bronze school awards and all have established Equality, Diversity and Inclusion (EDI) committees that are working through well-formulated action plans. Several schools (Chemistry, Natural Science and Computer Science and Statistics) are actively seeking to apply for sliver awards in April 2023 or 2024.

Two externally funded UG scholarship schemes were initiated within STEM in 2022 (Trinity College Dublin and Three Ireland Connect to STEM Scholarship; Johnson & Johnson WiSTEM^{2}D Programme). These seek to support and promote diversity in the UG student body.

Staff and Student wellbeing
Cost of living and accommodation shortages continue to impact the recruitment and retention of staff and students, particularly those at early career stage and at Ph.D. level. Salary determinations at appointment are more common place and some schools are reporting challenging levels of staff churn (academic, technical and administrative). Changes to the academic year structure and the staggered start of JF continue to place increased pressure on the Schools. Several external examiners report that the compression of the exam and assessment period is of concern and not conducive to positive student outcomes.

The STEM Ph.D. student cohort provide research impetus and much needed teaching support especially in laboratory and computer settings. The number and proportion of EU and Irish Ph.D. numbers has declined. The larger cohort of non-EU Ph.D. students has drawn upon many different types of support at school and College level. STEM contributors to the PG renewal programme hope to identify opportunities to provide more connected processes, and services to support, this student body.

Research and Teaching highlights
The Faculty of STEM uses ABC Research Productive Metric criteria using data drawn from RSS-generated School reports. All schools retained or exceeded, the percentage of research productive staff reported in the previous year.

In addition to this baseline activity data, there are many individual research highlights. Several ERC and IRC recipients arose within STEM in 2021/22. These included five winners of ERC proof-of-concept awards; Professors Valeria Nicolosi (Chemistry and AMBER, the SFI Centre for Advanced Materials and BioEngineering Research); Tríona Lally (Engineering and AMBER), Anna Davies (Natural Sciences), John Goold (Physics) and Matthew Campbell (Genetics and Microbiology) and three ERC Advanced awards to Professors Jennifer McElwain (Natural Science), Seamus Martin (Natural Science) and Daniel Kelly (Biochemistry and Immunology).

2021 was a momentous year in College which saw the appointment of our new Provost; epitomising 'a changing of the guard'. New emphasis was placed on biodiversity and sustainability leadership. Within STEM, this has materialised in what might best described as 'a greater alertness' to societal and environmental balance, and a desire to embrace the UN-SDG from multidisciplinary perspectives e.g. by leading-out on the E3 Kinsella Challenge-based Ph.D awards (supporting approximately 17 co-supervised Ph.D. projects).

Three STEM staff members were awarded Provost Teaching awards in 2021 (Professors Justin King (Engineering), Cormac McGuinness, (Physics) and Stephen Barrett, (Computer Science & Statistics) while the evaluations for the 2022-23 nominations and call for 2023-24 applications remain live.

Space

The growing sFTE across STEM (e.g. UG numbers rising from 3578 (2020/21) to 3645 (2021/22)) has resulted in some schools 'approaching or hitting capacity'. Space on campus is a limited commodity, leaving competing research and teaching needs to be addressed. Crowded laboratories and poorly serviced lecture theatres are detrimental to a positive student experience and this is further exacerbated by scheduling constraints and tight timetables. Staff and students are finding dwindling opportunities to connect e.g. for small group tutorials.

Concerns around the Goldsmith Hall continued to surface throughout 2021/22, including issues around capacity and safety. These prompted invitations to the Head of Safety and Director of Campus Infrastructure (Estates & Facilities Department) to give presentations to the Faculty Executive Committee (FEC). The arising discussions shed some greater understanding on the complexities of the challenges to face, which include insufficient funding for the maintenance/upgrade of existing spaces and

the many different types of space shortage e.g. for students to store PPE/belongings or to eat in the Hamilton Building. The delayed completion of the E3LF is impacting on E3 schools all of whom have increasing income targets to meet. No longer able to physically accommodate the number of students enrolled in certain modules, some schools have chosen to provide hybrid/repeat lecture offerings.

Consultation and Student Voices

The STEM FEC met 10 times in 2021/22. Its members comprise the directors of research institutes, Heads of Schools, two school representatives from technical/administrative staff, the ADUSE and our STEM undergraduate student representative (Sean Lysaght). Throughout most of 2021/22 postgraduate representation was sadly missing. Quality was a standing item at every meeting.

Three split or two-part FEC meetings have been held in 2022/23 to which additional contributors were invited (i) new faculty appointees (in a meet-and greet/on-boarding exercise) (ii) DUGTL and Senior Lecturer (to discuss UG teaching and assessments) (iii) DPGTL and Dean of Graduate Studies (to discuss the implications and directions of the PG renewal programme and the proposed changes around College Ph.D. awards). These meetings were a reflection of and a direct response to, just some of the matters raised here, in this 2021/22 quality report.

National student survey

Schools receive a school-specific breakdown of the national student survey data. Within STEM however they report that the structure of the survey does not support them well in identifying key actions to implement at a school level. These are more likely to emerge from the application of mixed methodologies to gather feedback, or more personalized staff/student mechanisms, which allow a rapid response to issues in real-time e.g. curriculum sequencing and bunched assessment deadlines.

Resource and Financial Constraints

The impacts of the new Budgetary Planning Allocation model will be clearer in 2023/24 however there is concern. The RGAM per student in the wet-based laboratory courses has not kept in line with costs and HEA STEM-based differentials/multipliers are poorly reflected in the BPA distribution. At present, final year capstone projects are being funded via PI research grants as there is no financial mechanism by which to support them within School budgets.

At this juncture the school budgets are meeting (or at least within reach of) expenditure in six of the 8 schools. Addressing the shortfalls in the others requires a long-term strategy and is all the more challenging in an inflationary environment in which non-pay and pay costs continue to rise.

Acknowledgment: This quality report was compiled/ drafted by Prof Sylvia Draper and Dr Katie O'Connor in collaboration with Heads of School, Directors, Professors, School managers and input from the STEM Faculty Executive Committee.

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SECTION 1: UNDERGRADUATE TEACHING

Quantitative Data to inform Faculty Performance on key metrics for Annual Faculty Quality Report.
[Ensure numbers reported are verified via sources above prior to submission]

Table 1a: Quantitative data on UG student module evaluation

School	Number of Undergraduate Modules taught (n)	Number of Undergraduate Modules Evaluated (n)	Percentage of Undergraduate Modules Evaluated (%)	Average response rate to UG module evaluations (%)
Biochemistry & Immunology	50	40	80%	30%
Chemistry	39	39	100%	66%
Computer Science and Statistics	80	80	100%	37%
Engineering	100 (Yrs 1 – 4)	100	100%	100% response rate in the Freshman and Sophister years due to method of evaluation.
Genetics and Microbiology	51	See comment	See comment	See comment
Mathematics	57	57	100%	48%
Natural Sciences	108	53	49 **%**	46%
Physics	41	38	92%	42%

Table 1b: Qualitative data on UG student module evaluation

School	Comments/Actions arising Evaluations	Summary of actions taken to respond to the outcome of student UG module evaluations
Biochemistry & Immunology	**Student comments** Some modules not well placed in the academic year -inappropriately placed relative to perceived prerequisites. Many students complimented the lecturers on their interest in their subjects and dedication to teaching. Students do not like wholly online modules. Practical classes were very interesting. Some timetabling issues are reported. Some module content overlaps too much with others.	Students reported some time-tabling issues: we hope that the additional administrative staff that we now have will minimize such issues. We will aim to respond to students' comments on the placement of modules in relation to each other, overlap of material etc. The only modules that are exclusively online are the 5 credit open modules in JS year and only where there are large numbers of students (>70) across multiple moderatorships taking the module. The issue here is the difficulty of timetabling these modules for multiple cohorts in the absence of a fixed flat timetable for the JS year. However, we will examine the possibility of including some face-to-face summary sessions or tutorials in these modules.
Chemistry	We are revising our syllabus and our assessment structure (exams and continuous assessment) to address the most of student comments (see below). We don't survey each individual module but hold liaison committee meetings with class reps, have a standing item on UG issues on the School Committee and have held all-class meetings with each year group.	Overall experience of students evaluated our undergraduate modules was very good, e.g. : - 54.8% responded good, 26.7% - responded excellent to the question "How would you evaluate your entire educational experience at this institution?" Also - 41% responded "Probably yes", and 48.3% responded "Definitely yes" to the question: "If you could start over again, would you go to the same institution you are now attending? ". We are going to address following comments of the students: "Have study groups or introduce more collaborative group work to help break the ice. Role play workplace scenarios applying knowledge of materials learned in class". "More engaging lectures, better feedback and interaction in tutorials, no modules solely online" "If you fail in the above approach or fall behind, it becomes incredibly stressful to catch up - perhaps slowdown in the amount of difficult content thrown at us all at once, especially in 3rd Year."

		"Put more emphasis on continuous assessment rather than exams." "More presentations - in science subjects" "Less exam % and more CA. CA in my opinion keeps you engaged throughout"
Computer Science and Statistics	Following student feedback surveys conducted in each semester, the DUTL and Associate DUTL arranged two meetings with Course Directors and Student Representatives (one after each semester) in order to collect additional feedback.	An Associate Director UG Teaching and Learning has the dedicated role of collecting quality assessments (e.g., student feedback surveys) and disseminating aggregated results to the module coordinators and School executives (e.g., Head of School, DUTL). Individual lecturers undertook module adjustments where appropriate based on feedback received. Example refinements would include the scheduling of assignments to reflect student workload across a given semester, or provision of additional learning resources for learning components that students were finding particularly challenging. After the DUTL meeting with student representatives two issues were identified. The DUTL emailed teaching staff in relation to those issues surfaced from this meeting namely: 1. To ask and advise staff to give students access to past papers if not available online; *and* 2. To remind staff of guidelines regarding appropriate levels of feedback for FYP/dissertation report drafts.
Engineering	Evaluations with the student representatives in each semester before assessments across the Freshman and Sophister years..	Feedback discussed with the module coordinators and actions taken. Head of Disciplines discuss feedback with their module coordinators of the Sophister modules, whilst Director of Undergraduate Teaching & Learning discussing evaluation feedback with the Freshman module coordinators, including those coordinators in service teaching schools.
Genetics and Microbiology	From March 2020 until early 2022 the School has been without a School Manager, and for part of this time also without an EO in Genetics/Human Genetics.	We are currently developing a module feedback questionnaire and procedure to implement feedback schoolwide. This should be in place in the second term of the current academic year.
Mathematics	Each lecturer is provided with the summary scores of a range of questions regarding the teaching and anonymised	See comments in section opposite

	comments. The surveys cover the overall satisfaction, difficulty, and workload of the module. The surveys also include comments on lecturer presentations, tutorials, course materials both in general and specific. Lecturers respond by adjusting presentation styles, materials provided to students, and support for students for example in the past year lecturers schedules additional tutorials and review sessions.	
Natural Sciences	See bullet point list below:	- School is implementing a centralized process for future academic years to increase quality of feedback and average response rates. - Slightly reduced the amount of CA associated with set reading and activities - Increased the difficulty of the radiocarbon dating assessment. Moved the online Q&A class to an in-person seminar - Better communication of module tasks/activities - None - feedback was very positive, and timetabling constraints made some suggestions (more lectures, outdoor practical's) impossible - Modification to CA structure, weighting and deadlines - Modification to CA submission dates. Additional details on CA. Addition of lab slots to timetable. - Maintain option to prerecord presentation (brought in because of covid restrictions), bring face to face practical teaching back fully - Modification to CA submission date. Module review tutorial. Practice examinations

		• Wider selection of available resources for reflective CA assignment
		• Additional tutorials. Discussion with desk study advisors on topic setting and communication balance.
		• All activities moved from hybrid to in-person; final assessment modified to more explicitly connect it to lecture material
		• Wider range of practitioner talks. Additional materials to support communication skills for various audiences.
		• Reading lists provided on lecture slides, earlier clarity on assignments
		• Formal office hours, recordings delivered in 3x15 min sections per each lecture
		• Change of assessment deadlines to after Christmas (module runs across 2 semesters)
		• Module evaluation survey on Blackboard not completed by students, verbal feedback was positive - also fed back via student meetings with External Examiners
		• Very positive feedback so not much to change but converted student presentations into a team presentation on specific themes to avoid repetition of content and provide students with collaboration experience.
Natural Sciences (cont.)		• Change in assessment frequency/weighting.
		• Revision of online notes to 2/per page.
		• Lower number of assessments. Explicit time on assessment guidance, Re-recording of heavily accented invited speaker
		• Faster return of feedback on formative assessment.
		• Revised all lectures to have greater clarity of structure and key points. Introduced new lectures and lecture components. Expanded section two of the module (dropping some elements from section 1 to make room)
		• Change in assessment weighting.
		• Some students found the scientific content and readings challenging, so module was revised to include more class discussion on specific readings and more time taken to explain key concepts with more opportunity for students to ask questions

Natural Sciences (cont.)		• Small changes to CA assessment • better communication and fairer deadlines for lab groups A and B, no longer alternate sessions. • now recommend a suitable textbook, • Different assessment structure and deadlines • Increase the percentage contribution of the Clare Field trip in the Final mark for the module • Encourage return to F2F Practical after Covid restrictions removed • Reduced assessment load. More details of online assessments provided ahead of time. • Allow optional participation in Antrim field trip during Study Week • Changed from a non-residential field course to a residential field course for 22-23 • Clarify the alignment between lectures, practicals and assessments. • Modification of peer assessment for group work to reflect relative contributions better. Production of tutorial videos for software and practical tasks. • Pre-field trip tutorials added, different assessment implemented • Keep delivering the field course component • Clearer statement of learning outcomes linked to assessments • Changes to the phylogeny practical • create a suggestions box through blackboard for topics and questions that the students would like to cover in tutorials. • Additional tutorials added early on. • Better preparation for blog assessment; consideration of new discussion topics • Involve the class more in selection of topics • Reinforce the method of active learning that underpins this module's delivery
Physics	Response rates were much better than in the prior A/Y 2020-21 which were very low (14%) with online module	The relevant lecturer or lab supervisor is provided with a copy for personal reflection on their practice.

	evaluation over Blackboard. For this reason, the SoP reverted in-person paper forms, with set in-class evaluation time in A/Y 2021-22. Following evaluations and class representative feedback for 2020/21, taken together with our own judgement, we remained with online exams in 2021-22, redoubling efforts to maximise face-to-face teaching and tutorial provision, and improving Blackboard communications and lecture release timing to help students better manage their learning.	Feedback has been mostly reassuring, given perceived lingering low student morale at the beginning of the year. The DTL(UG) discusses with the relevant colleague on the rare occasion of specific, actionable constructive critical feedback. Where student feedback exposes, e.g., build-up of student workload during specific periods, or what students perceive as discontinuities between modules or components, this is addressed with help of the DTL(UG) and/or Year Head. The School is investigating the logistical means to swap back the semester order of two JS modules (tangled with labs and Trinity Electives), which were swapped when TEP was implemented, in part in response to student feedback.

Table 2 Open Module Evaluation – Science, Technology, Engineering and Mathematics (STEM)

At Departmental/Discipline level, Schools are asked to conduct evaluations of their Open Modules and report back through the Annual Faculty Quality Report (AFQR). If Departments/Disciplines in your School offer modules as Open Modules, please answer the question below:

School	Schools that provide open modules are asked to comment on the experience of the evaluation of open modules (year 2).
Biochemistry & Immunology	For BIU33150 Students happy with format of in course MCQ (40%) and Exam (60%) One or two students indicated that content was too much...but recognised that they have plenty of choice in exam This is an online module and one student suggested that an in-person tutorial session could be useful We are examining the possibility of incorporating an online practical so that it goes to 50% in course and 50% exam as well as having face to face summary sessions for each of the 4 sections of the module
Chemistry	We have only one open module (Trinity Elective) "The Chemistry of Periodic Elements", which received positive feedback.
Computer Science and Statistics	SCSS has no dedicated Open Modules. Students taking SCSS modules as Open Modules are included in the general surveys above.
Engineering	The School of Engineering does not offer open modules in our curriculum.
Genetics and Microbiology	Genomics and Systems Biology - We are currently developing a module feedback questionnaire and procedure to implement feedback schoolwide. This should be in place in the second term of the current academic year.
Mathematics	N/A
Natural Sciences	N/A
Physics	Note all physics open modules are core modules on some courses while being open modules on other courses. Hence, response is as for the UG student module evaluation entry above.

Table 3a: Quantitative data on Undergraduate External Examiner Reports

School	No of External Examiner Reports Expected (UG)	No of External Examiner Reports Returned (UG)	% of External Examiner Reports Returned (UG)	Did the School respond in writing to EE recommendations?	Did the External Examiner(s) have or request access to Blackboard?
Physics	1	1	100%	Yes ☒No☐	Yes ☒No☐
Biochemistry & Immunology*	4	4	100%	Yes ☒No☒	Yes ☐ No☒
Chemistry	6	6		Yes ☒No☐	Yes ☐ No☒
Computer Science and Statistics	5	5	100%	Yes ☒No☐	Yes ☒ No☐
Engineering*	6 – EE report for each of the Engineering Disciplines including MAI	6	100%	Yes ☒No☒	Yes ☒ No☐
Genetics and Microbiology	3	3	100%	Yes ☒No☐	Yes ☒No☐
Mathematics	1	1	100	No	Yes
Natural Sciences	6	6	100	Yes ☐No☒	Yes ☒No☐

*Not all EE received written responses, some were verbal

Table 3b: Qualitative data on Undergraduate External Examiner Reports

School	Comment/Actions arising from EE Reports	Summary of actions taken to respond to UG external examiner recommendations:
Physics	See **recommendations section opposite.**	Given our Extern's feedback "The curriculum design and content are certainly of an appropriate, very high standard. The quality of the project reports I read was extremely high and it is clear that TCD's physics students are extremely well-equipped to compete internationally with their peers. The curriculum contains both the core topics one would expect and modules on state-of-the-art sub-fields spanning the breadth of modern physics." the School's main effort is focused on maintaining these standards in the face of Covid-19 'long-tail' challenges. These include perceived reduced incoming student familiarity with good study practices, exam technique, etc., as well as the demands on staff to meet research commitments that had been made more difficult by Covid-19 restrictions. The Extern reported that they found, to their mind, both good and less appropriate examples of questions for open-book exam format. There was a slight, valid academic difference-of-opinion concerning questions in some subjects (some would argue that information really must be learned and demonstrated, not just skills). This has been rendered essentially moot by a full return to conventional closed-book format for our exams (we do plenty of CA, as always), and there is little or no appetite at present within the School for further open-book exams at this time, with a view to maintaining academic integrity.
Biochemistry & Immunology	The Immunology External Examiner requested a cut in the SS thesis word count which will be actioned for 2023-24. JF and SF Med The course is very strong in Biochemistry, Metabolism and	The UG external examiners stated that more administrative assistance was necessary to relieve the very high burden on the staff. We now have an additional Executive officer and a school manager whose appointments will help to streamline the process. One SS EE stated 'the rather tight schedule can lead to unnecessary stress situations for students and lecturers'- we will endeavour to time-table exams in a longer time-frame to ease this stress.

	Immunology. The students are well trained and appreciate the importance of being conversant with basic principles in their formation as future clinicians. But it is remarkable how TCD students accept molecular concepts as an integral part of clinical training, which is not the case in most medical schools.	
Chemistry	We have fully responded to external examiners reports and provided all necessary feedback via the Quality Office. We are also taking action to address all issues raised by the EEs (see below).	-To revise Inorganic Chemistry curriculum within academic year 2022/23 -To try to make the JS Bioinorganic chemistry module a core module rather than an open module. - The handbook is to be updated in revision in the next year 2023. -To improve the justification of marks and ensure that more detailed and specific comments and detailed feedbacks are provided by examiners. -To provide the students with a selection of questions to answer rather than all of the problems set in the exam papers. -Try to implement a special project-report-writing training session. -To provide more opportunities to practice and learn how to approach problem-solving questions.
Computer Science and Statistics	n/a	n/a
Engineering	Electronics & Electronic/Computing: Many comments echo pre-existing concerns and subsequent actions – e.g., move away from online examination modes (cheating concerns), better sequencing of modules and project work, an examination of the structure of the C/CD/D stream and optionality	

	Civil Engineering: Suggest more time between S1 examinations and return of marks – the school is in discussion with the Senior Lecturer on this matter Biomedical Engineering: Suggest that the internship grading is pass/fail – adopted this year. Possibility of making internship mandatory is being explored Note: MMBE - Externs had access to module material through shared folders in SharePoint, based on their previous comments. The externs had noted that the BB system was hard for them to navigate in previous years, and they found the SharePoint folder more useful to them this year.	
Genetics and Microbiology	In relation to a comment from the Human Genetics EE we have implemented a very comprehensive feedback procedure on reviews.	Plan to address EE feedback
Mathematics	There was no external examiner for pure mathematics in 2021/22. This was due to long-standing difficulties in finding and retaining externals which were exacerbated by COVID.	The external report for Theoretical Physics was not shared with the school in a timely manner and the school had to directly contact the external for his report. The report was generally positive about the programme with no recommendations for significant changes. One suggestion was to have a third marker for the projects that have a large discrepancy between the first two markers. This will be adopted in 2022/23.

	Note: At the March 2023 Quality-dedicated FEC clarification on this issue was sought. It had arisen due to a changeover of staff in the Quality Office. The matter has since been resolved.	The ongoing issues in external recruitment and retention meant there was no external examiner in pure mathematics in 21/22. An external examiner has been found for 2022/23 however the underlying difficulties persist and the risks for the future remain.
Natural Sciences	Retention of field based teaching in SNS degree programmes, review of gaps in key areas of course content and development of new modules to address this. Inclusion of more GIS and employability facing design content being embedded. Review assessment approaches and expectations for 5 and 10 ECTS credit modules Use of the 70+ marking range for exceptional work Strengthen feedback provision and consider amount of feedback given in many cases this is really exceptional given staff: student ratios	Development of new course content to address external examiners comments, but this also mirrors gaps that had been addressed within SNS committees and these developments were in train. Review of field course organisation to ensure they can be managed more sustainably from a financial and timetable perspective. SNS DUTL to meet with SL to identify key field teaching periods for SNS in the timetable in order to protect these T&L activities.

SECTION 2: POSTGRADUATE TEACHING

Table 4a: Quantitative data on Postgraduate Module Evaluation

School	No. of PGT Programmes	No. of PGT Programmes Evaluated	% of PGT Programmes Evaluated	Average response rate to PGT programme evaluations (%)
Biochemistry & Immunology	2	2	100%	20
Chemistry	1	1	100	20%
Computer Science and Statistics	3	3	100%	Differs per programme. M.Sc.Iinteractive Digital Media (IDM) 42%. High levels of feedback rate for M.Sc CS, as feedback is gathered via meetings rather than surveys.
Engineering	12 (7 Diplomas and 5 MSc/Phil)	12	100%	
Genetics and Microbiology	1	1	100	Approx. 50%
Mathematics	2	1	50	60
Natural Sciences	4	2	50	
Physics	2	2	100%	Energy Science: 90% Quantum Science & Technology: 80%

Table 4b: Qualitative data on Postgraduate Module Evaluation

School	Comment/Actions arising from EE Reports	Summary of actions taken to respond to the outcome of postgraduate module evaluations
Biochemistry & Immunology	**Student comments** Increased time for assessments, Increased tutorials, quicker response/marking for assignments, more feedback Make slides available in Blackboard in advance of lectures	We implemented the requests from the students to make the lecture slides available in blackboard in advance of the lectures. Response from students on module feedback/evaluation is particularly poor at only 20% approximately, even though each student is requested to provide feedback on each module following completion. The time to complete "in person" short question exams was increased from 1-1.5 hours or 1.5-2 hours depending on the module. In addition, example questions were provided beforehand, as requested. Marks were returned to students, with additional feedback in a timely manner, as requested.
Chemistry	Only 2 students have provided their comments on "Circular Economy and Recycling Technologies" course.	The students who responded asked for more in-person activities during the day but the course was designed to be online with live tutorials in the evenings so it would not interfere with the day-jobs of participants
Computer Science and Statistics	SCSS offers 3 PGT Programmes which are disparate in size. Written programme/module surveys were conducted for the online Postgraduate Certificate in Statistics and Interactive Digital Media courses. Computer Science MSc consists of 4 strands, and each strand lead meets the strand student cohort several times during the semester for a detailed feedback session.	In IDM programme, the course director increased weekly office hours available to the students to enable more immediate and continuous feedback rather than final evaluations only. In CS, individual lecturers undertook module adjustments based on received feedback (re, e.g., timing of the assignments).
Engineering	Feedback discussed with the module coordinators and actions taken.	Feedback discussed with the module coordinators and actions taken.

Genetics and Microbiology	Course coordinators held an evaluation session with students following the second year of this new MSc in Genomic Medicine.	The feedback overall was extremely positive for this growing MSc offering from the School.
Mathematics	There were no actions arising from the evaluations and the student comments were generally positive.	This was the first year of this new MSc. While there were no specific actions responding to student comments, some modifications and rescheduling of individual modules were made to improve the structure of the programme.
Natural Sciences	Courses were evaluated in a number of ways. For all courses, the course directors play an active role in assessing levels of student satisfaction throughout the year. For most, individual module evaluations were also used. Two courses (BioCon and Env Science) noted that module evaluation had slipped since covid, but that they will ensure a system in place to maximise the responses for academic year 2022-23. It should be noted that even in those instances where module evaluation forms were not administered, student feedback is gathered in other ways. Students also give feedback to the external examiner.	Three of the four courses have been in existence for over a decade, while one course (Smart and Sustainable Cities) is in its second year of intake. The course director for this course has used evaluations to gain insights into key areas of the course, such as the challenges around timetabling for optional modules. Some problems were identified around the timing of the methods modules offered. The course director responded by creating a new module 'Approaches in Smart and Sustainable Cities', which ran in the second intake year. In addition, students noted some issues around clarity of communication. This was also amended for the second year of intake.
Physics	See **recommendations section opposite.**	**Energy Science:** According to the feedback from academic 2021-22, some students thought that a few exams are assigned too late. The notice of dates has been given earlier in 2022/23 **Quantum Science & Technology:** Feedback from students suggested that the first and second semesters were unevenly loaded in 2021-22. Therefore in 2022-23 we moved one module from the second semester to the first semester.

Table 5a: Quantitative data on Postgraduate External Examiner Reports - Science, Technology, Engineering and Mathematics (STEM)

School	No of External Examiner Reports Expected (PG)	No of External Examiner Reports Returned (PG)	% of External Examiner Reports Returned (PG)
Biochemistry & Immunology	2	2	100%
Chemistry	0	0	0
Computer Science and Statistics	3	3	100%
Engineering	12	12	Dip in Project Management Dip in Applied Building Repair and Conservation Dip in Health and Safety in Construction Dip in Fire Safety Practice Dip in Construction Law and Contract Administration Dip in Environmental Monitoring, Assessment & Engineering Dip in Sustainable Energy Dip in Engineering for Climate Action MSc in Engineering [Environmental, Structural & Geotechnical/Transport/ Sustainable Energy] MSc in Electrical Information Engineering/Micro-credential in XR; Applications and Technologies MSc in Biomedical Engineering MPhil Music and Media Technologies MSc in Mechanical Engineering
Genetics and Microbiology	1	1	100
Mathematics	1	1	100
Natural Sciences	4	4	100
Physics	2	0	0%

Table 5b: Qualitative data on Postgraduate External Examiner Reports - Science, Technology, Engineering and Mathematics (STEM)

School	Comment/Actions arising from EE Reports	Summary of actions taken to respond to PG external examiner recommendations
Biochemistry & Immunology	Fewer online exams due to abnormally high marks	As recommended by the external examiner all exams were in person, except for 2 online 5CTS modules which were carried while student were on industry placements
Chemistry	This course was run for the first time in 2021/22 with its contents condensed into six months. No external examiner was appointed;	New course and no EE yet so actions will be drafted and addressed next year
Computer Science and Statistics	**N/A**	**N/A**
Engineering	**<u>Dip in Project Management</u>** As a result of the external examiners report we will make it more clear to internal markers of coursework to direct how they mark the work. This was a recommendation. In addition, this year we are ensuring that written assignments are submitted via Turnitin or anti plagiarism software. The external examiner was very positive about this successful course in general stating " The overall marks attained by students and the quality of work produced in general is a testament to the dedication and professionalism of the programme team. It has been another challenging year for teaching staff and students alike so well done to all for completing the year successfully! Learner feedback obtained via the Course Questionnaire is generally very positive. Some mixed views were expressed in relation to online versus in class learning experiences.	See **comments section opposite.**

Dip in Applied Building Repair and Conservation

The external examiner asked for some references to be added to the course list which was actioned.

Dip in Health and Safety in Construction

The comments from the External Examiner were very positive, for instance he stated that "Feedback provided by the students was extremely positive regarding all aspects of the programme and the value it had to their learning and careers moving forward."

Regarding assessment, the External Examiner suggested a greater level of referencing and a stronger evidence basis should be provided by the students their risk assessment documentation i.e. an extra column indicating the sources of their control measures – this will demonstrate that they are reading widely and supporting their statements appropriately - This has been communicated to the students this year.
 Regarding marking, we were asked to ensure that on examination scripts all examiners provide a rationale for what the students wrote well versus what they did not do well. - This has been communicated to the lecturers this year.

Dip in Fire Safety Practice

The External examiner deemed all aspects of the course to be satisfactory. They did note some concern over low marks for many students in paper 2 of the final examinations and recommended that this should be monitored the following year- This will be looked at this year (2022-23) and if marks are low again this will be discussed at the Exam Board, and with the Director of Post Graduate Studies to see if some course of action is required.

Dip in Construction Law and Contract Administration

The External Examiner did not make any requests.

Dip in Environmental Monitoring, Assessment & Engineering

The course did not run in 2022/23, so actions were not taken. However, all actions were taken in the prior year and 2021/22 comments were very minor (visibility of sample answers with exam scripts).

Dip in Sustainable Energy

The external examiner was happy with the programme content, assessment method and delivery. Coursework was of very good quality. Additional instructions for Blackboard will be given for the examiner. Examples were given to the students of previous work however this will be more explicit as EE felt that templates would be useful for students in completing their work.

Dip in Engineering for Climate Action

The external examiner was happy with the running of the programme and course content and delivery. No comments for changes were provided.

MSc in Engineering [Environmental, Structural & Geotechnical/Transport/ Sustainable Energy]

-Action is being taken on in as much as possible
balancing modules offered in each discipline.

-There is an outline marking scheme or guide for dissertations for academics and this will be made available to the external in 2023.

-Certainly, feedback to students on their dissertation will be encouraged for 2023.

Overall the external was happy and commented that:

"Standards are high and the students are very good, with high pass rates. The students are of a similar standard to those in my own institution, and others in which I have acted as external examiners. The students are broadly comparable to those I've met in previous years in TCD"

External Examiner Comment: It was not clear to me how much feedback was given on the milestone report. Perhaps this could be clarified, or formalised? One suggestion is to use it to give formative feedback (within 10 days of submission, say), but not assess at that point in a summative manner towards the project mark itself. This removes the need for second marking and so on, and may also be useful in keeping projects - and writing - on track.

Action: The feedback structure has been formalised and all students now receive formal feedback from their supervisors regarding their milestone reports within a specified time period. This is overseen by the coordinators.

MSc in Electrical Information Engineering/Micro-credential in XR; Applications and Technologies
"Recommendation: Overall, it may be valuable for the department to perform a SWOT analysis outlining their strengths, weaknesses, opportunities and threats. This is likely done for the accreditation process for the department/School. Students are happy with the program curriculum, and the quality of research and internship opportunities. In this regard, a potential threat is that the academic staff appear to be overly stretched currently. In order to increase BME content in years 1 and 2, to

ensure that the program can continue to offer BME focused projects for our BAI/MAI research project students, and to maintain or grow the size of the MSc in Biomedical Engineering, there needs to be an increase in the numbers of academic instructors. In discussion with faculty, they expressed that ideally this person would be in the Medical Devices space with expertise in either computational mechanics or implantable devices. There may be opportunities to engage alumni of the program for the benefit of the students, providing their perspective on the program, best practices for research/internships and their current position etc. I assume there is also some exit interviews from students, but alumni surveys may be help to establish how well the program is meeting its objectives. I understand that there is the ABET equivalent governing body in Ireland that provides standards for accredited engineering programs and I suspect such surveys may already be in place."

Response: We thank you for your recommendations which we believe will certainly strengthen our program. We recently performed a SWOT analysis of our program at a BME Strategy Day which we found to be extremely helpful and established a number of action items that we are working on as a group to improve our program. We strongly agree with you that additional academic staff in BME are critically needed to maintain our current program and to facilitate potential growth in this area such as in Years 1 and 2, in addition to continuing our MSc offerings. For example, we are keen to deliver BME content in years 1 and/or 2 and are in the process of developing module descriptors which could work in these earlier years. However, as you mentioned, the BME staff are already overly stretched and so it is simply not feasible to implement our plans with current resources. We have and will continue to engage with the School on this issue. Engaging with Alumni is another excellent recommendation which will certainly benefit our program. The BME stream was established in 2012 so we are very near the 10-year anniversary of our first graduates.

We are hoping to organize a large Alumni event to celebrate this occasion. Moreover, we currently invite Alumni to deliver talks to our students in Year 2 to help them choose their stream for year 3, and we also have a Seminar Series in year 3 where we invite industry representatives including Alumni to educate our BME Students on what it is like to work in this industry. As I mentioned above, a key strategic area for us going forward is to engage with industry and working with our Alumni is an excellent mechanism to achieve this.

MPhil Music and Media Technologies
Feedback as very positive.

MSc in Mechanical Engineering
Selected issues that were raised in 2021/22:
- The external examiner alluded to student complaints of excessive workload due to too many assessments being bunched up too closely together, and that flexibility with deadlines was appreciated but this could cause knock-on effects with other assessments. In our view, given the tight semester timing set by College, some peaks in workload are inevitable but efforts are made to distribute assessments throughout the semester, without exceeding teaching term dates. Furthermore, students do not always seem to appreciate that 1 ECTS credit equates to 20 to 25 hours of student effort and that they should take responsibility for managing their own time. In response to this concern, a shared spreadsheet record has been kept since 2020/21 of all module assessment deadlines, to avoid severe peaks as best as possible.
- The external examiner appreciates that exam papers no longer provide choices but require each question to be answered, thus guarding against selectively learning material and ignoring some aspects that may have negative

	repercussions in subsequent years. Following similar recommendations from previous external examiners, we have consistently applied this rule to all exam papers. • Feedback from the external examiner was generally positive, and he noted that "overall standards are very high and seem to be in line with those of the very strongest Universities in the UK."	
Genetics and Microbiology	In summary, the External Examiner lauded the growing success of this postgraduate offering after the second year of this MSc programme.	No actions noted.
Mathematics	The external examiner report for the QFSG MSc was not shared with the school and had to be obtained directly from the external examiner late in the academic year.	One issue raised by the external was the two-tiered nature of the programme which presented some initial difficulties as students had different backgrounds and levels of preparation for the course. As mentioned in the report, this was mitigated by the second semester. We reviewed the content of some of the first semester modules to improve the delivery of these modules. In the current year we have monitored this issue and in the current year there doesn't seem to have been a similar problem.
Natural Sciences	See action / recommendation section opposite.	BioCon: report was very favourable. Main action has been to try and streamline timetabling information for students and provide this before each semester – in some cases this is challenging particularly where modules involve field visits and external speakers.

		Environmental Science: report from the external examiner was very positive. Main request was to inform students as soon as possible about module evaluation results. An effort is being made to provide feedback as soon as possible. The 2021-2022 cohort were much more satisfied with than previous years due to more in person practical field and lab work. However, one of the problems during the academic year 21-22 was the overseas field trip cancellation. This problem has been addressed adequately during the current academic year and in fact two field trips have been offered to students (overseas and Ireland). The external examiner recommended to keep developing hybrid (online / in-person) options for robustness of the learning program but continue to emphasize in person attendance is preferred. This has been taken very seriously into consideration this year for some of the modules (Desk Study, online presentations).
		Masters in Development Practice: External examiner raised some concerns about the marking rubric for the dissertations which

		teaching staff will revise based on this feedback. Smart and Sustainable Cities: A key point articulated by the external examiner was around the drop in grades for students taking optional modules within Engineering subjects (Transport Policy, Energy Policy). Course director discussed this issue with key members of staff in Engineering. In the longer-term, it is hoped that this can be addressed via the provision of a new module. However, it should be noted that these issues have not been as challenging for the current group of students (second year intake). In particular, the changes to the aforementioned methods module has helped students select modules on the basis of expertise/ability, rather than upon timetabling.
Physics	**Energy Science:** The course does not have external examiners this year, the management team will have a further discuss about appointing an External Examiner in the future. **Quantum Science & Technology:** We did not manage to obtain an external examiner for the first cohort of this course. We are in the process of searching for one for the next academic year.	**See comment section opposite**

SECTION 3: Student survey

The national student survey takes a holistic approach to the student experience from living accommodation to the quality of teaching.

Table 6a: Results of the National Student Survey.ie 2021/22 – issues identified

School	*Based on the results of the National Student Survey.ie, identify a maximum of 3 issues that the school will address*	*Identify barriers to addressing/improving any issue:*
Biochemistry & Immunology	Students would like more feedback on assignments and where it does happen that it is returned more promptly	Heavy workload and the multiple component nature of modules and associated assessments affects the timely return of corrected assignments.
	More engagement between lecturers and students, let students know it's ok to ask questions	Students are always reluctant to engage despite entreaties to do so.
	More tutorials and small group learning and other opportunities to meet other students as it's hard to meet in very large classes	Tutorials and small group learning is difficult to organize within the busy timetable
Chemistry	- Put more emphasis on continuous assessment rather than exams to keep students engaged throughout. - Have special study groups and introduce more collaborative group work for applying knowledge of materials learned in class.	We need more academic stuff and additional administrative support in order to address the issues above. These are main barriers.
Computer Science and Statistics	When comparing with the National Student Surveys findings the School of Computer Science and Statistics (SCSS), together with STEM and indeed TCD in general, score very low on average in staff-student interaction. It should be noted however that the SCSS scores marginally higher than the TCD average. We will solicit	A number of inhibitors exist: - Large class sizes and a high student: staff ratio (SSR). The SCSS SSR increased to 20 in 2021/22. - Limited availability of rooms for interactive/small group learning techniques. A need exists for a larger number of

	feedback from students as to measures and instruments by which to improve this. Conflicting feedback has been received relating to the amount of coursework, structure (e.g., groupwork) and timing. Feedback seems to point to occasions where temporal occurs placing potentially undue pressure on students.	small meeting rooms for interactive group work, breakout sessions and similar.
Engineering	The number of responses represents only a tiny percentage of the undergraduate student population. Nevertheless, the numbers broadly align with the college average figures. Many of the complaints and suggestions relate to systemic problems, largely related to funding – e.g. facilities, staff-student ratios, better support systems. Others relate to structural/organizational factors at the university level – e.g intensity of the term structure, prioritization of research over teaching	Institutional Funding Willingness to address our academic year structure and move to something more realistic in terms of the intensity
Genetics and Microbiology	Please note that the results of the survey we are reviewing do not seem to be from students in the School of Genetics and Microbiology as the count number is significantly larger than the number of students in our School. These data were collected from a larger student body which has not been defined in the information we have received and therefore our comments are directed more at Faculty level than School level as it would seem this survey is. One of the lowest scoring items is 'student/faculty interaction' (10.8/60). We believe that this response is from 1st year and 4th year UG students – it would have been valuable to understand the difference in response from these two groups of students. It is our opinion that if we could introduce to 1st and/or 2nd year some small group teaching with, for example, post-doc scientists providing tutorials, our students would enormously value this interaction and gain a significant feeling of ownership and belonging	One key barrier for many improvements is finance. As an aside, it would be extremely valuable for the student experience to improve the facilities in Hamilton area, even a coffee dock/cart etc. would be of great value and would provide a focal point for students.

	immediately upon entry to the university in Semester 1. We do not understand the cost implications of this but feel that this would be a very helpful mechanism by which we could at least in part redeem our reputation in these national surveys. By way of example when our School had a direct entry to Human Genetics, we implemented in 1st year small group tutorials (1-2hrs per week). Consistently every year the students indicated that it was their favourite class and that they felt they were very lucky compared to their peers in Biological and Biomedical Sciences who did not have the same small group teaching. Perhaps every school involved in Biological and Biomedical Sciences could set aside 1hr per week, 3 rooms, with one PhD student or post-doc per room to take a small group tutorial in current/cutting edge topics in Biological Sciences. Overseen by one academic per School, this tutorial would hopefully help to provide to our first years in Semester 1 with a sense of belonging to Schools/Faculty which could address the 'student/faculty interactions' and 'supportive environment' parameters for which we have not scored well in the national survey.	
Mathematics	From student surveys three issues which were raised and which the school will address are: There was a request for more student-faculty interaction. There was a noted need for more and improved tutorials. In particular there were requests for smaller tutorials and for better facilities.	The main issue with tutorials is one of resources. There is a lack of rooms and teaching spaces with a suitable layout – e.g. tables where students can work in small groups and where tutors can circulate among students. Additionally, a lack of flexibility in timetabling means finding suitable tutorial slots is difficult and it requires significant administrative work. The small number of PhD students in the school means there is a shortage of well qualified tutors. Relatedly, finding financial resources to pay for tutorial and demonstrating staff is challenging.

	There were several comments noting that providing additional material such as lecture notes and recordings would be useful. The school will improve this where pedagogically appropriate.	There are also barriers to providing additional learning materials. Foremost is the high existing workload of teaching staff resulting in insufficient time for preparing such extra materials. There are also some practical difficulties such as a lack of necessary equipment in all rooms e.g. cameras for blackboards and finally there are technical difficulties such as automatic captioning not working well with technical and mathematical terms (or often with standard words).
Natural Sciences	1. The transition back to in-person teaching and supports for students. 2. Need for feedback and clearer communication	1. Continued impact of COVID closures and required restructuring of term times and associated knock-on impacts 2. College-wide issues with lines of communication (inter-sectional) and expanding staff:student ratios impact on capacity.
Physics	We are continuing to provide access to greater levels of online materials and Blackboard tools than prior to the Covid-19 years. It is considered primarily a matter for the individual teacher to decide what approach is best, depending on the class and material. We have increased, and this will continue, the number of combined teaching events like double-lectures, to facilitate those with longer commutes or diverse responsibilities. We are emphasising the necessity for students to attend classes and take notes, nothing that this is essential to foster community and peer-to-peer learning.	Some students suggestions are beyond the School remit, e.g., opportunity to take additional credits, improve the STEM buildings, improve the Tutorial service, more student accommodation, more socialisation among students. Provisional of online backup lecture material, while clearly helpful to some students, is not viewed at a high level but nonetheless seems to have a discernible detrimental impact on attendance and then engagement (e.g., note taking) in class. There does not seem to be an easy solution. Timetabling remains a serious technical challenge every year, and the students pick up on this 'improve scheduling'.

Table 6b: Results of the National Student Survey.ie 2021/22 –response to issues

School	Outline how each issue will be addressed
Biochemistry & Immunology	We will remind all PIs of the college regulations that coursework be returned within 20 days. Lecturers will be reminded to encourage engagement by using active learning methods such as clicker questions in-class and to facilitate peer to peer interaction by offering group projects or group discussions during class. We will try to reduce/combine assessments but the challenge is that students often only engage when there is an assessment We will try to reinstate the peer-to-peer tutorials that we held prior to Covid.
Chemistry	-We are currently revising our syllabus in some of our disciplines (e.g. Inorganic Chemistry) and planning to introduce more continuous in course assessment exercises for students, particularly in problem solving and essay writing. -We aim to develop special study workshops focused on problem solving and applying the knowledge from lectures.
Computer Science and Statistics	Solicit feedback from students on how to improve satisfaction on staff-student interaction metric, and assess which improvements are possible within current parameters of large, and increasing, student sizes. Undertake programme-level mapping of coursework types and deadlines in order to assess distribution of the workload and more specifically to identify any pinch points in terms of bunching of workload. If such points are identified a spreading of/reduction in the load will be actioned.
Engineering	In terms of facilities, the E3 learning foundry will help to address this issue and should improve the overall student learning experience for the School of Engineering. In addressing the intensity of term time, the School will look at the deadlines for coursework to reduce the burden on year groups at specific times
Genetics and Microbiology	As noted in table 6b - One key barrier for many improvements is finance. As an aside, it would be extremely valuable for the student experience to improve the facilities in Hamilton area, even a coffee dock/cart etc. would be of great value and would provide a focal point for students.

Mathematics	The relaxing of pandemic restrictions has meant that student-faculty interactions in teaching have returned to previous levels. We have also re-started organizing social meetings for incoming Fresh students. We have helped support the Mathsoc, Physoc and TPSA which organize events, some of which involved academics giving talks.
	To address the issue of tutorials we plan to recruit more PhD students and to increase the number of tutors. We can also increase the number of tutorials, and reduce timetabling issues, by holding some sessions online. We plan to find additional space by moving some activities into recently renovated rooms which will provide more space suitable for tutorials. We further plan to extend the hours of the math help room in House 20 and add a session in collaboration with the Disabilities office. However, the shortage of space and timetabling issues are difficult to address entirely within the school particularly with regard to service teaching.

We have refurbished some lecture rooms which are now more suitable for recording lectures and will continue to improve our teaching facilities. However, many rooms are not managed by the school and so can't be improved in this way. We will familiarize staff with these facilities to reduce the technical issues encountered. The workload of staff is a more challenging issue which cannot be straightforwardly addressed without finding funding for additional staff. |
| Natural Sciences | As noted in table 6b |
| Physics | The few discernible issues within the School's remit are being understood an addressed through continued discussion with, e.g., SU convenor at monthly School Exec, Class Reps. at staff-student liaison meetings. We plan to restart a peer-to-peer teaching mentoring system for staff, to make available an undergrad 'suggestion box', we are running an academic staff Away Day to discuss teaching and learning (as well as research). |

SECTION 4: Professional Accreditation

Table 7: Professional Accreditation – Science, Technology, Engineering and Mathematics (STEM)

SCHOOL	ACCREDITED PROGRAMME	PROFESSIONAL OR STATUTORY BODY	YEAR OF MOST RECENT ACCREDITATION	IF ACCREDITATION TOOK PLACE IN 2021/22, SPECIFY WHETHER IT WAS IN PERSON OR VIRTUALLY	Comment if any conditions resulted from Accreditation Report outcomes e.g. reduced period of accreditation	Actions taken in response to accreditation outcomes
School of Engineering	**B.A.I/M.A.I. - Civil, Structural & Environmental Engineering**	Engineers Ireland	March 2022 5 years Re-accreditation in 2025/2026	In person	NA	We are still awaiting on some of the panel reports, and we will take appropriate, coordinated, action once all have been received.
	B.A.I./M.A.I. - Computer Engineering					
School of Engineering	**B.A.I./M.A.I. - Electronic Engineering**	Engineers Ireland	March 2022 5 years Re-accreditation in 2025/2026	In person	NA	We are still awaiting on some of the panel reports, and we will take
	B.A.I./M.A.I. - Electronic & Computer Engineering					

SCHOOL	ACCREDITED PROGRAMME	PROFESSIONAL OR STATUTORY BODY	YEAR OF MOST RECENT ACCREDITATION	IF ACCREDITATION TOOK PLACE IN 2021/22, SPECIFY WHETHER IT WAS IN PERSON OR VIRTUALLY	Comment if any conditions resulted from Accreditation Report outcomes e.g. reduced period of accreditation	Actions taken in response to accreditation outcomes
		Engineers Ireland		In person	NA	appropriate, coordinated, action once all have been received.
	B.A.I./M.A.I. - Mechanical & Manufacturing Engineering **B.A.I./M.A.I. Biomedical Engineering**				NA NA	We are still awaiting on some of the panel reports, and we will take appropriate, coordinated, action once all have been received.
			BSc in Environmental Science and Engineering – N/A (new) March 2022	In person In person In person In person In person	NA NA NA	

SCHOOL	ACCREDITED PROGRAMME	PROFESSIONAL OR STATUTORY BODY	YEAR OF MOST RECENT ACCREDITATION	IF ACCREDITATION TOOK PLACE IN 2021/22, SPECIFY WHETHER IT WAS IN PERSON OR VIRTUALLY	Comment if any conditions resulted from Accreditation Report outcomes e.g. reduced period of accreditation	Actions taken in response to accreditation outcomes
	B.Sc. (Ing) / M.A.I. (optional) Engineering with Management		5 years Re-accreditation in 2025/2026		NA	
	MSc in Engineering (Civil)					
	MSc in Mechanical Engineering					
	BSc in Environmental Science and Engineering					
	M.A.I. (optional year 5) - eligibility for Chartered Engineer status by Engineers Ireland for all seven programmes			In person	NA NA NA NA	
				In person		

SCHOOL	ACCREDITED PROGRAMME	PROFESSIONAL OR STATUTORY BODY	YEAR OF MOST RECENT ACCREDITATION	IF ACCREDITATION TOOK PLACE IN 2021/22, SPECIFY WHETHER IT WAS IN PERSON OR VIRTUALLY	Comment if any conditions resulted from Accreditation Report outcomes e.g. reduced period of accreditation	Actions taken in response to accreditation outcomes
				In person In person In person		
	MSc in Electronic Information Engineering		March 2022 5 years Re-accreditation in 2025/2026	Accreditation didn't take place in 21/22		
	Additional: Diploma programmes already accredited by Engineers Ireland. One-off accreditation required only – accounts for 20 hours of annual 35-hour requirements for Chartered Membership: 1. Applied Building Repair and Conservation 2. Construction Law and	Engineers Ireland	To apply for accreditation - potentially in 2025/2026	N/A		

SCHOOL	ACCREDITED PROGRAMME	PROFESSIONAL OR STATUTORY BODY	YEAR OF MOST RECENT ACCREDITATION	IF ACCREDITATION TOOK PLACE IN 2021/22, SPECIFY WHETHER IT WAS IN PERSON OR VIRTUALLY	Comment if any conditions resulted from Accreditation Report outcomes e.g. reduced period of accreditation	Actions taken in response to accreditation outcomes
	Contract Admin 3. Environmental Monitoring, Assessment and Engineering 4. Fire Safety Practice 5. Health and Safety in Construction 6. Project Management 7. Sustainable Energy and Environment 8. Diploma in Engineering for Climate Action (New)					
School of Physics	**B.A. (Moderatorship) in Physics**	Institute of Physics (IoP)	23 Nov 2018 (all UG programmes)	Accreditation valid to November 2022. Accreditation visit took place in September 2022. Awaiting		
	B.A. (Moderatorship) in Physics & Astrophysics					
	B.A. (Moderatorship) in Theoretical Physics (joint programme with School of Maths)					

SCHOOL	ACCREDITED PROGRAMME	PROFESSIONAL OR STATUTORY BODY	YEAR OF MOST RECENT ACCREDITATION	IF ACCREDITATION TOOK PLACE IN 2021/22, SPECIFY WHETHER IT WAS IN PERSON OR VIRTUALLY	Comment if any conditions resulted from Accreditation Report outcomes e.g. reduced period of accreditation	Actions taken in response to accreditation outcomes
	B.A. (Moderatorship) in Nanoscience (joint programme with School of Chemistry)			the outcome.		
Biochemistry & Immunology	**Nanoscience** (joint programme with School of Chemistry)					
School of Computer Science and Statistics	**B.A.I./M.A.I. - Computer Engineering** **BA/MCS Integrated Computer Science**	Engineers Ireland	March 2022 5 years Re-accreditation in 2025/2026			

SECTION 5: Quality initiatives and issues

Table 8: Quality initiatives

School	Outline the three quality initiatives undertaken by the School in 2021/22 that you wish to showcase as good practice/enhancement activities.
Biochemistry & Immunology	Improved AV systems for practical classes and lectures to facilitate online teaching

Developing online versions of practical classes with associated data components to be made available for students who cannot attend in person and have permission to be absent.

Providing pre-exam advice sessions for students (JS) who previously have not had face to face assessments |
| Chemistry | 1. Providing video-recorded lectures on all modules to students via Blackboard.
2. Updating and modifying JF, SF and JS Chemistry lab manuals.
3. Providing extra tutorials for all students on problem solving questions. |
| Computer Science and Statistics | The pandemic continued for the greater part of the 2021/22 academic year again prohibiting the initiation of substantive quality initiatives. Although new processes and procedures had been established resources were still focused on the need for agility in meeting the evolving and changing circumstances of the pandemic while ensuring that not only were our teaching, research and support services sustained but they were also maintained at the same exacting standards albeit in a fundamentally different manner.

The School formally established an Equality Diversity and Inclusion (EDI) Committee this year which is proactively working through the School's Athena Swan Bronze Award action plan with the aim of securing a Silver Award in 2024. These initiatives are having a positive impact on the School community.

In response to the new College policy on Blended Working and also delivering on an Athena Swan action, the School developed guidelines for the implementation of the Blended Working Pilot for its professional and support staff. Nearly all the professional and support staff are now availing of Blended Working, and an associated improved work life balance. Quality of Service delivery is being monitored under these new work practices. If any such deterioration in service were to be identified |

	then the current policy would be revisited. Thus far no deterioration in service has been witnessed yet an increase in staff morale has been felt.
Engineering	The School established a new five year programme, Environmental Science and Engineering, in collaboration with Natural Sciences under E3 with the first intake having entered college in September 2021. The offering is extremely popular as evidenced by the entry requirements and calibre of students. We expect the programme to go from strength to strength in the coming years. The Schools research activity, both publications and grant income, continues to grow. This coupled with strategic growth initiatives within and excluding E3 serve to cement our place as the #1 Engineering school in Ireland and a leader internationally. The School was successful in achieving 5 year accreditation across our programme offerings (UG & PG) from Engineers Ireland. The School has in 2022 developed a multi-annual Strategic Plan following consultation amongst the disciplines. It details our vision and aspirations going forward.
Genetics and Microbiology	Implementation of shared news forums for the School, including our digital noticeboards/screens and online newsletter, as a means of showcasing School activities in both Genetics and Microbiology and enabling greater connectivity between the personnel in the separate buildings that house the School. Establishment of an early career researchers' forum for post graduate students and postdoctoral scientists with monthly seminars and refreshments. Thus far this has proven to be an extremely successful initiative. Replacement of key administrative and technical staff for the School during the 2022 period. Timely and smooth pathways are in place and have enabled replacement of key staff providing vitally important supports for our School. Careful evaluation of potential shared teaching between the two disciplines, Genetics and Microbiology, to optimize the student experience, pedagogical outcomes, and staff resources.
Mathematics	One of the most significant new teaching activities in 2021/22 was the MSc in Quantum, Fields, Strings and Gravity. A key part of the curriculum was the Theoretical Physics student seminar which provided an opportunity for students to engage in current research topics and to learn communication and presentation skills. An important choice was involving other school research staff – research PhD students, postdocs and faculty – which made the seminar an active and rigorous event.

	The maths help room is run daily during term and is an opportunity for students in all maths modules to come and ask mathematics and theoretical physics questions. This provides important additional support for students who are struggling with their course materials or who need help with assignments. Re-opening the maths help-room after the pandemic has been an important aim of the school. It is in high demand and extending the number of tutors, the breath of topics covered, and the accessibility of teaching rooms are future goals. We carried out significant renovation of the Salmon and Synge lecture theatres. This included improvements to the AV equipment, for example installing cameras and improved lighting, as well as general refurbishment. This allows for improved on-line and hybrid format teaching as well as simply providing a more comfortable learning environment.
Natural Sciences	1. Managed return to face-to-face teaching following covid. This has been handled well, including the return of overseas field courses (South Africa, UK), with due care taken to minimize potential COVID issues. This has been a significant enhancement on the previous year for staff and students. In addition, courses developed hybrid options for specific modules. 2. E3 Teaching Committee and New Course Development: As part of the rolling out of the E3 initiative, Natural Sciences has been involved in discussions relating to building new course offerings. As part of this, we have also engaged in substantive review of our existing courses. One particular area of quality concern has been ensuring that adequate module sharing happens across programmes to best facilitate inter-disciplinary learning. 3. Survey and workshop exploring future of PGT in School. In Jan 2022, the Director PGT&L organized a school wide questionnaire survey to assess the preferences of staff for future direction of PGT. This was followed by a half-day workshop attended by around 30 staff, which explored options and potential challenges in more detail. 4. Implemented/disseminated new PGR and Supervisor/Students handbooks produced by Graduate Studies office within the school. Information is included in draft updated PG handbook.
Physics	The Institute of Physics accreditation review panel found the part outlined below of our practice worthy of wider dissemination: "The school reported that one of the outcomes of the changes made as a result of the pandemic, was the possibility of using virtual experiments as a method to permit reassessment in failed laboratory modules. The panel thought this was an example of good practice that could be more widely disseminated as it may avoid the need for students to retake a module, or even a year, to progress."

Table 9: Quality issues

School	Please outline any quality issues that fall outside the remit of the School for <u>escalation</u> to Faculty or College-level
Biochemistry & Immunology	Need for access to large venue spaces for lectures at sophister level that involve students from all 4 moderatorships. An ideal location exists in Trinity central but these are currently restricted to a single school and not open for booking even though they are rarely used
Chemistry	N/A
Computer Science and Statistics	The approval and recruitment processes for both academic and non-academic staff. One of the main activities of the School over the past year has been its endeavours to fill a number of vacant posts which have arisen due to both retention issues and retirements. The pace of recruitment has been such that only two of six academic appointments required for September 2022 were in place for the commencement of the academic year. This together with delays in Professional staff appointments is hampering our ability to deliver existing and future programmes to the exacting standards that we have previously delivered. The availability of adequate, preferably contiguous, space continues to pose serious difficulties for the School. The School will move to the refurbished contiguous space vacated by Trinity Research & Innovation (TR&I) in Westland Row later this year which will be hugely beneficial. However, the opening of the E3 Learning Foundry is further delayed. Functioning with insufficient and inappropriate space severely hampers the ability of the School to recruit and retain staff, and deliver our programmes using state-of-the-art facilities. The recruitment of PhD students in the current environment is becoming increasingly difficult. The problems include fees (EU and NEU), the low level of stipends, increasing cost of living, lack of (affordable) accommodation in Dublin together with a very buoyant jobs market. The falling PhD numbers is further creating a shortage of qualified demonstrators essential to support undergraduate teaching. As a first step to alleviate some of these difficulties College should address both EU and NEU fee issues and accelerating opportunities

	and relaxing constraints associated with PostDocs undertaking limited lecturing. The School would wish to see this as part of the mandatory training aspects of such positions.
Engineering	The emergence of ChatGPT and OpenAI resources. The School needs guidance from the University on an overarching approach to ensuring integrity of assessment processes. The tight timeline between conclusion of exams and entry of marks into SITS, particularly for classes with large cohorts in the Freshman years. This is an ongoing problem. We are looking at the AYS and as in consultation with the SL. Ongoing reviews by Estates and Facilities of teaching spaces, e.g. Goldsmith Hall, Museum Building etc. Review of plagiarism procedures by Senior Lecturer / Dean of Graduate Studies. The procedure, especially at UG level, is too cumbersome. We are looking at developing processes in consultation with the SL
Genetics and Microbiology	SS capstone projects: There is currently no finance from the College to support SS capstone research projects which in STEM, when wet laboratory based, can cost a few thousand euro per student. At present, these projects are typically (inappropriately) funded via PI research grants. There should be College finance to support SS capstone research projects, a key selling point of TCD UG degree courses. UG student numbers: It is proposed that student numbers in TCD increase. If this results in significant numbers of extra UG students, which is being considered given multiple pressures, it will put SS capstone research projects in STEM under threat. The quality of SS research projects will likely be impacted and indeed may have to be in part or totally 'dry' lab/online offerings. With respect to the above, maintaining good student:staff ratios will be important in maintaining the quality of the student education and experience in TCD. Infrastructure: The lecture theatres and laboratory spaces need to be upgraded to accommodate any increases in UG student numbers particularly in the JF and SF years, but also in the Sophister years in individual Schools. These spaces are already under pressure even with current UG student numbers. To provide an excellent student experience in STEM, and to be competitive with that offered by other national and international universities, investment in the College infrastructure is urgently required.

Mathematics	As has been noted in previous quality reports, the recruitment and retention of external examiners has been quite problematic. This was significantly worsened by the pandemic, the after-effects of which are still being felt, with workloads increasing dramatically and colleagues less willing to take on additional duties. The role of external examiner has itself been increasing in difficulty, not least due to increased numbers of exam sessions and deferrals for which their input is needed. In addition, the administrative overhead they face applying for a PPS number is a disincentive given the small fee they receive. These issues resulted in the school not having an external examiner in mathematics in 2021/22. While an examiner for 2022/23 has been found, the pool of candidates that are willing to do the job is small and it is to be expected that problems will continue in the future.
	There is an issue with the distribution and coordination of the external's reports. The 21/22 reports were not shared with the school via the shared online folder. The school had to contact the external examiners directly to get access and were told that they had been previously returned to the college. In the future, it may be helpful if the externals send a copy of their reports directly to the school when submitting so they can be considered in a timely fashion.
	The issue of available tutors and appropriate space for tutorials is becoming quite critical. Class sizes have grown and there are often not enough rooms or rooms of appropriate size.
	Ongoing timetabling difficulties cause significant problems in delivering the undergraduate programme. It is difficult to provide students with sufficient module choices due to clashes. Students are also often scheduled with excessively long blocks of lectures and lectures at late hours.
Natural Sciences	- Communication across the College admin areas remains a significant risk to quality which falls outside the remit of the School. For example in relation to dates of graduation and dates by which marks need to be entered into SITS – Course directors have noted they received no/limited information on this and were "operating in the dark". - At PG taught and PG research level LENS reports are not automatically provided to Module Coordinators. The school has had several conversations with the Disability Office on this matter. However, there does not appear to be an immediate solution. - Additionally, course directors have noted that in general LENS reports are often inappropriate and non-specific for PGT. For example, the inclusion of generic statements, e.g., requesting an extension of exam time or a quiet room, is unhelpful for PGT

	where there are no annual or semester examinations. The main value of LENS reports is simply to flag up students who need some extra support, dialogue between the student and Course Director can more usefully define the nature of that support.
Physics	The External Examiner for Physics has raised two points that fall outside the School remit in their final report after a 3-year term. Their text is as follows: Overall, I have been very impressed with TCD Physics' commitment to providing high quality, engaging, and challenging – in the best possible sense of that term -- undergraduate education. There are, however, a number of pressing issues at central University level that are worrying and need to be addressed as soon as possible: - The extreme compression of the exam and assessment period is not at all conducive to fostering a healthy student experience, nor does it facilitate high quality marking or, indeed, provide sufficient time for external examiners to complete their assessment. This issue needs to be addressed as a matter of some urgency. - Similarly, it is completely unacceptable for students to find out whether or not they are progressing on their course as little as one working day before the start of the academic year. There have been a number of distressing tragedies in the UK recently arising from student mental health issues exacerbated by academic pressure and, at times, a lack of communication from university authorities. TCD, again as a matter of considerable urgency, should do everything in its power to ensure that undergraduates know well in advance of the start of the academic year as to whether they are progressing on their course.

Appendix A: Faculty Retention Data (the following tables refer to UG courses)

Table:1.1 Retention by Standing & Retention	STEM	%
1	**1012**	**27.76%**
Progressed Same Course	894	24.53%
Repeat Same Course	25	0.69%
Transferred to Another Course	38	1.04%
Not Retained	55	1.51%
2	**850**	**23.32%**
Progressed Same Course	799	21.92%
Repeat Same Course	20	0.55%
Transferred to Another Course	2	0.05%
Not Retained	29	0.80%
3	**833**	**22.85%**
Course Completed		0.00%
Progressed Same Course	789	21.65%
Repeat Same Course	27	0.74%
Transferred to Another Course	1	0.03%
Not Retained	16	0.44%
4	**780**	**21.40%**
Course Completed	462	12.67%
Course Completed - Exit	100	2.74%
Progressed Same Course	201	5.51%
Repeat Same Course	7	0.19%
Transferred to Another Course	1	0.03%
Not Retained	9	0.25%
5	**170**	**4.66%**
Course Completed	169	4.64%
Repeat Same Course		0.00%
Not Retained	1	0.03%
Grand Total	**3645**	**100.00%**

Table 1.2: Retention by Standing & Gender (n)	Female	Male	Null	STEM Total
1	**461**	**546**	**5**	**1012**
Progressed Same Course	417	472	5	894
Repeat Same Course	5	20		25
Transferred to Another Course	18	20		38
Not Retained	21	34		55
2	**376**	**471**	**3**	**850**
Progressed Same Course	364	432	3	799
Repeat Same Course	1	19		20
Transferred to Another Course		2		2
Not Retained	11	18		29
3	**333**	**500**		**833**
Course Completed				
Progressed Same Course	325	464		789
Repeat Same Course	4	23		27
Transferred to Another Course		1		1
Not Retained	4	12		16
4	**312**	**468**		**780**
Course Completed	243	219		462
Course Completed - Exit	20	80		100
Progressed Same Course	45	156		201
Repeat Same Course	1	6		7
Transferred to Another Course		1		1
Not Retained	3	6		9
5	**57**	**113**		**170**
Course Completed	56	113		169
Repeat Same Course				
Not Retained	1			1
Grand Total	**1539**	**2098**	**8**	**3645**

Table 1.3: Retention by Standing & Gender (%)	Female	Male	Null	STEM Total
1	**30.0%**	**26.0%**	**62.5%**	**27.8%**
Progressed Same Course	27.1%	22.5%	62.5%	24.5%
Repeat Same Course	0.3%	1.0%	0.0%	0.7%
Transferred to Another Course	1.2%	1.0%	0.0%	1.0%
Not Retained	1.4%	1.6%	0.0%	1.5%
2	**24.4%**	**22.4%**	**37.5%**	**23.3%**
Progressed Same Course	23.7%	20.6%	37.5%	21.9%
Repeat Same Course	0.1%	0.9%	0.0%	0.5%
Transferred to Another Course	0.0%	0.1%	0.0%	0.1%
Not Retained	0.7%	0.9%	0.0%	0.8%
3	**21.6%**	**23.8%**	**0.0%**	**22.9%**
Course Completed	0.0%	0.0%	0.0%	0.0%
Progressed Same Course	21.1%	22.1%	0.0%	21.6%
Repeat Same Course	0.3%	1.1%	0.0%	0.7%
Transferred to Another Course	0.0%	0.0%	0.0%	0.0%
Not Retained	0.3%	0.6%	0.0%	0.4%
4	**20.3%**	**22.3%**	**0.0%**	**21.4%**
Course Completed	15.8%	10.4%	0.0%	12.7%
Course Completed - Exit	1.3%	3.8%	0.0%	2.7%
Progressed Same Course	2.9%	7.4%	0.0%	5.5%
Repeat Same Course	0.1%	0.3%	0.0%	0.2%
Transferred to Another Course	0.0%	0.0%	0.0%	0.0%
Not Retained	0.2%	0.3%	0.0%	0.2%
5	**3.7%**	**5.4%**	**0.0%**	**4.7%**
Course Completed	3.6%	5.4%	0.0%	4.6%
Repeat Same Course	0.0%	0.0%	0.0%	0.0%
Not Retained	0.1%	0.0%	0.0%	0.0%
Grand Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 1.4. Retention by Standing & Fee Status (n)	EU	NEU	STEM Total
1	**889**	**123**	**1012**
Progressed Same Course	787	107	894
Repeat Same Course	18	7	25
Transferred to Another Course	35	3	38
Not Retained	49	6	55
2	**774**	**76**	**850**
Progressed Same Course	729	70	799
Repeat Same Course	16	4	20
Transferred to Another Course	2		2
Not Retained	27	2	29
3	**732**	**101**	**833**
Course Completed			
Progressed Same Course	691	98	789
Repeat Same Course	25	2	27
Transferred to Another Course	1		1
Not Retained	15	1	16
4	**740**	**40**	**780**
Course Completed	451	11	462
Course Completed - Exit	82	18	100
Progressed Same Course	194	7	201
Repeat Same Course	5	2	7
Transferred to Another Course	1		1
Not Retained	7	2	9
5	**154**	**16**	**170**
Course Completed	154	15	169
Repeat Same Course			
Not Retained		1	1
Grand Total	**3289**	**356**	**3645**

Table 1.5. Retention by Standing & Fee Status (%)	EU	NEU	STEM Total
1	**27.0%**	**34.6%**	**27.8%**
Progressed Same Course	23.9%	30.1%	24.5%
Repeat Same Course	0.5%	2.0%	0.7%
Transferred to Another Course	1.1%	0.8%	1.0%
Not Retained	1.5%	1.7%	1.5%
2	**23.5%**	**21.3%**	**23.3%**
Progressed Same Course	22.2%	19.7%	21.9%
Repeat Same Course	0.5%	1.1%	0.5%
Transferred to Another Course	0.1%	0.0%	0.1%
Not Retained	0.8%	0.6%	0.8%
3	**22.3%**	**28.4%**	**22.9%**
Course Completed	0.0%	0.0%	0.0%
Progressed Same Course	21.0%	27.5%	21.6%
Repeat Same Course	0.8%	0.6%	0.7%
Transferred to Another Course	0.0%	0.0%	0.0%
Not Retained	0.5%	0.3%	0.4%
4	**22.5%**	**11.2%**	**21.4%**
Course Completed	13.7%	3.1%	12.7%
Course Completed - Exit	2.5%	5.1%	2.7%
Progressed Same Course	5.9%	2.0%	5.5%
Repeat Same Course	0.2%	0.6%	0.2%
Transferred to Another Course	0.0%	0.0%	0.0%
Not Retained	0.2%	0.6%	0.2%
5	**4.7%**	**4.5%**	**4.7%**
Course Completed	4.7%	4.2%	4.6%
Repeat Same Course	0.0%	0.0%	0.0%
Not Retained	0.0%	0.3%	0.0%
Grand Total	**100.0%**	**100.0%**	**100.0%**

Table 1.6 : Faculty STEM by programme

Programme	Retention	1 Female EU	1 Female NEU	1 Male EU	1 Male NEU	1 Null EU	2 Female EU	2 Female NEU	2 Male EU	2 Male NEU	2 Null EU	3 Female EU	3 Female NEU	3 Male EU	3 Male NEU	4 Female EU	4 Female NEU	4 Male EU	4 Male NEU	5 Female EU	5 Female NEU	5 Male EU	5 Male NEU	Grand Total
Biological and Biomedical Sciences	Course Completed															136	6	76	3					221
	Progressed Same Course	149	29	49	10		147	23	52	5		128	15	65	2									674
	Repeat Same Course	1										1	1	1				1						5
	Transferred to Another Course	5	1	8					1									1						16
	Not Retained	10	1	4			3		2			2		3		1		1						27
Chemical Sciences	Course Completed															32		24						56
	Progressed Same Course	40	2	20			33	3	22		1	29	1	21	1									173
	Repeat Same Course	1												1										2
	Transferred to Another Course	2																						2
	Not Retained	3		1	1		3		2															10

Programme	Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total
Computer Science	Course Completed																			7	2	24	2	35
	Course Completed - Exit															3		39	6					48
	Progressed Same Course	23	5	80	28		18	2	55	13		14	4	60	12	2		30	2					348
	Repeat Same Course			4	3				7	2				4				1						21
	Transferred to Another Course	1			1																			2
	Not Retained			4	1				3	1		2				1		1	1					14
Computer Science and Language	Course Completed															2		2						4
	Progressed Same Course						4		12	1		5		10										32
	Repeat Same Course											1												1
Computer Science, Linguistics and a Language	Progressed Same Course	5	1	10		1																		17
	Repeat Same Course			1																				1

Program	Status	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17	c18	c19	c20	c21	c22	Total
	Transferred to Another Course			1																				1
	Not Retained	1		1																				2
Engineering	Course Completed																			40	2	72	8	122
	Course Completed - Exit															12	2	24	9					47
	Progressed Same Course	56	5	113	9		55	5	105	12		43	19	120	35	37	2	105	2					723
	Repeat Same Course		1	3	2				2	1				7	1		1	2	1					21
	Transferred to Another Course	2		4																				6
	Not Retained	3		9			1		5					5	1		1	2						27
Engineering - Double Diploma	Not Retained																				1			1
Engineering with Management	Course Completed																			4	1	7		12
	Course Completed - Exit															3		1	1					5
	Progressed Same Course	9	2	13	2		6		17	1		6		15	1	3	1	17						93

																									Total
	Repeat Same Course			2					1																	3
Environmental Science and Engineering	Progressed Same Course	7	3	7	1																					18
	Transferred to Another Course	1																								1
	Not Retained			1																						1
Geography and Geoscience	Course Completed																				22	1	18		41
	Progressed Same Course	33		18		1	21	3	28		1	24	1	22											152
	Repeat Same Course								1																1
	Transferred to Another Course	1																								1
	Not Retained						1																		1
Management Science and Information Systems Studies	Course Completed																				8		20		28
	Progressed Same Course	11	3	13	2		15	1	15			14	1	17	2										94

Subject	Outcome																		Total
	Repeat Same Course			1										1						2
	Transferred to Another Course	1																		1
	Not Retained													1						1
Mathematics	Course Completed																10	14		24
	Progressed Same Course	12	1	24		2	5		32		1	5		25						107
	Repeat Same Course			1			1		1			1		2						6
	Transferred to Another Course	2	1	2					1											6
	Not Retained		1	3	1		1		4											10
Physical Sciences	Course Completed																18	31	1	50
	Progressed Same Course	15	1	38	2	1	14		34		10	1		34	3					153
	Repeat Same Course			1					1					3						5
	Transferred to Another Course	1		1																2
	Not Retained	2		6	1		1	1						2						13

		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	Grand Total
Theoretical Physics	Course Completed															8		30						38
	Progressed Same Course	5		32	1		8	1	28			5		19										99
	Repeat Same Course	2		2					3					3				1						11
	Transferred to Another Course			3										1										4
	Not Retained			1					1									1						3
Grand Total		**404**	**57**	**480**	**66**	**5**	**336**	**40**	**435**	**36**	**3**	**290**	**43**	**442**	**58**	**298**	**14**	**442**	**26**	**51**	**6**	**103**	**10**	**3645**

Table 1.7: New Entrant Year 1, 2021/22 by Faculty Standing & Retention	STEM	%
Year 1	1012	100.00%
Progressed Same Course	894	88.34%
Repeat Same Course	25	2.47%
Transferred to Another Course	38	3.75%
Not Retained	55	5.43%
Grand Total	**1012**	**100.00%**

Appendix B: Faculty Risk register 2022

Summary of STEM Risk Title (1/12/2022)
This should be short risk title that outline's the risk in a clear and concise way, for example, "GDPR Risk", "Staff and Student wellness Risk" or "Space capacity Risk"
1: Large-scale equipment failures
2: Inadequate or unsuitable space for teaching and research
3: Over-dependence on key staff/posts that are difficult/costly to replace
4: Financial uncertainty
5: Significant and imbalanced resource issues on the implementation of TEP
6: Serious accident/event/disclosure arising from legislative non-compliance. Need to dispose of equipment and material that is hazardous.
7: Loss of key personnel
8: Diminishing institutional research profile
9: Inability to respond effectively to external events and evolving student markets
10: Decline in PGR numbers across FEMS
11. Risk of increasing and escalating costs of doing STEM-based research due to Brexit, Ukraine War and disruptions to supply chains
12. Reduced ability to retain and recruit UG students
13. Risk of staff and student burnout
14. Human capital initiative (HCI) - logistics and operational challenges
15. Inadequate IT infrastructure
16. Goldsmith Hall - Health and safety concerns
17. Goldsmith Hall - reputational damage and teaching space Inadequacies/ negative learning experience
18. Capstone projects are a key feature of STEM courses but are financially and resource intensive.
19. Change to the BPA and the implications of this
20. Continuation of research is dependent on infrastructure, finances, staff, PhDs and resources
21. Recruiting and maintaining PhD numbers
22. Cost of living in Dublin risk and housing crisis plus inflation

Note: The risk titles are an overview of what the risk entitles. Though some risk titles may appear similar the risk descriptions, risk ratings and controls differ greatly for each risk. The risk titles and numbering correlates directly with the FSTEM master risk register for 2022.