Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

FACULTY OF ENGINEERING, MATHEMATICS AND SCIENCE QUALITY REPORT 2016

Updated April 2017

1. EXECUTIVE SUMMARY

The Faculty of Engineering, Mathematics and Science (FEMS) Quality Report 2016 was compiled using submissions from the eight Schools, External Examiner Reports, the ISSE Report 2015-16, the International Student Barometer 2015-16, the PGR survey 2015-16 and retention data extracted from the Senior Lecturer Report 14-15.

The draft report was discussed at length at a special meeting of the Faculty Executive Committee on Thursday 8 December 2016, with the participation of Roisín Smith, the College Quality Officer. Following on from a suggestion at last year's meeting, all Directors of Teaching and Learning were invited to attend the meeting in addition to the members of the Faculty Executive Committee.

As a Faculty, we are generally happy with the quality assurance procedures in place at undergraduate level. The percentage of modules being evaluated is high at 98%. Despite noting that procedures were to be put in place to ensure that all modules are evaluated from 2015-16 onwards, this has not yet materialised. There is a relatively high rate (80%) of formal course assessment at PGT level. The four courses not formally assessed in the School of Computer Science and Statistics are closed to new entrants from September 2016.

During the FEC Special meeting on quality it was noted that there was widespread support towards replacing modular with programme evaluations and recommending a Faculty-wide tool to manage them. If adopted, this would also address the concerns raised by the SU at the meeting. These proposals will be discussed in more detail with the Academic Secretary in the coming year.

Data gathering methods, methods for discussing results and for providing feedback to students on actions taken remain largely the same as in last year's report. The Faculty noted that response rates are significantly enhanced when paper-based survey are used, though the consequent increase in time and resources when analysing the resultant data were noted.

Achieving the College procedures for providing timely feedback on assessments to students continues to be raised as an issue within some Schools. The Schools concerned will continue to work on mechanisms and approaches to enable this requirement to be met, and we hope to see this appearing less frequently in student feedback as the procedure is bedded down.

Two School reviews were conducted during the period, in the School of Chemistry and the School of Computer Science and Statistics. The Implementation Plan (IP) for Chemistry has been approved by the College Quality Committee, with the IP for SCSS to be presented at the February meeting of the Quality Committee.

The Faculty has continued to lead in engagement with the Trinity Education Project. Following the TR071 programme review in 2015, the Undergraduate Science Education Working Group has proactively engaged with the TEP and substantial modernisation of the programme architecture, moderatorship offerings and prerequisites for the TRO71 General Entry Science course should result in a better experience for undergraduate science students. It is looking hopeful that some of the recurring issues, such as fixed timetabling and semesteristaion, will be dealt with through the TEP project.

Retention in UG courses in the Faculty is high, and meeting the College's Strategic Plan target of 90%. Where individual course retention falls below that level, it is in small-intake courses where one student retiring from a course can have a significant impact on the retention rate.

Arising from the special Faculty Executive Committee meeting on quality, the following key points were noted when reviewing the academic year 2015-16:

- Schools across the Faculty employ a diverse range of methods to evaluate their undergraduate and PGT programmes, including surveys (online and paper), one-to-one interviews or group feedback sessions, feedback from class reps and course directors.

- Schools in the Faculty have a variety of mechanisms in place for disseminating student feedback to the appropriate staff and committees within the school.

- 98% of undergraduate modules were evaluated in 2015-16.

- 80% of PGT courses were formally evaluated in 2015-16.

- 85% of UG and 86% of PGT external examiners reports were returned in 2015-16, for assessments during AY2014-15. Reports for AY2015-16 continue to be submitted during Michaelmas term 2016.

- Three Schools in the Faculty have programmes that are subject to external professional accreditation (Schools of Engineering, Computer Science & Statistics, and Physics).

- The rate of progression of JF to SF (remaining on the same course) 90.2%, against a College Strategic Plan target of 90%.

- Two Schools and TCIN were subject to School reviews during the period.

Arising from the special Faculty Executive Committee meeting on quality, the following key actions were noted for 2016-17:

- Several Schools felt that individually evaluating every module may not be the most appropriate way to gather data on the student experience, especially at UG level. The Faculty is to explore the possibility of replacing modular evaluation with programme evaluation in certain circumstances, with the dual aim of enabling an assessment of overall student experience and reducing the incidence of survey fatigue among students.

- In 2016-17, Schools in the Faculty will place emphasis on enhancing the feedback loop mechanisms to the both student body and to external examiners. This will include an evaluation of the methods and success of the School Executive Committees, DUTLs and DPTLs, Student Liaison Committees, and Curriculum Development Committees.

- The Faculty continues to seek to fill the vacant established Chair positions across the eight Schools.

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Professor Vinny Cahill
Dean of Faculty of Engineering, Mathematics and Science

2. QUALITY REPORT

2.1 Quality of Undergraduate Programme Provision

Across the Faculty, approximately 98% of undergraduate modules across the eight Schools were evaluated. In spite of noting enhanced procedures during the previous academic year, only two of the eight Schools achieved the Council-mandated requirements that all UG modules were to be evaluated.

Best practise from other Faculties that could be incorporated to increase the modular evaluation rate are reminders at School meetings, emailing reminders to module leaders, including guidelines in staff handbooks and mentioning the requirement for evaluations at adjunct staff induction day.

As reported in previous years a variety of methods are used to evaluate modules such as online surveys, paper surveys and meetings with the students. The School of Biochemistry and Immunology make use of Blackboard to get feedback from students for evaluation purposes. The School of Computer Science and Statistics use the Qualtrics package for their reviews.

In terms of response rates, these ranged from moderate to high. Methods used vary between Schools, with the main methods being electronic surveys, paper-based survey and meetings/focus groups. It was noted by a number of Schools that the response rate to online surveys was very low and that the response rate to paper surveys has improved greatly. It was their opinion that students are more likely to give written comment in a paper based survey than an online survey. While it is generally accepted that in-class evaluations tend to produce higher response rates, this is not feasible in Schools with large numbers of undergraduate modules and restricted resources.

All Schools provide feedback to their students although the methods vary from emails, class group meetings, or face-to-face meetings with class representatives to discuss feedback.

During 2015-16, 85% of 2014-15 UG External Examiner Reports were returned for FEMS programmes, which is on par with the return rate of the previous two years. Schools reported that the reports are distributed by the School Administrative Managers to all relevant staff members. External Examiners commented on the harmonization rules failing students when they have passed the year overall. Schools noted the comments at their examinations meetings but they do not have the remit to change this regulation.

One School noted that the new External Examination process is working well, and that issues raised by External Examiners were being addressed by the Senior Lecturer and the Schools involved. Five Schools held additional meetings with the Senior Lecturer, focussed on repeat issues raised by External Examiners reports.

Three Schools are subject to professional accreditation. There were no accreditation reviews during the period, and all relevant programmes continue to be professionally accredited.

The School of Chemistry and School of Computer Science and Statistics were subject to School reviews in 2015/16.   The Implementation Plan (IP) for Chemistry has been approved by the College Quality Committee, with the IP for SCSS to be presented at the Quality Committee meeting in February 2017.

2.2 Quality of Postgraduate Programme Provision

Of the 24 Postgraduate Taught (PGT) programmes run in the Faculty in 2015/16, 19 were subject to formal review. One programme in Engineering was evaluated through twice-yearly informal interviews with the students. The four programmes not evaluated in Computer Science and Statistics are closed to new entrants from September 2016.

Methods used for evaluations, feedback to students and so on, are broadly similar to those reported for UG courses.

During 2015-16, 86% of 2014-15 PGT External Examiner Reports were returned for FEMS programmes, which is on par with the return rate of the previous two years.

The Faculty welcomes the fact that Postgraduate Research evaluations are being rolled out across College. It was noted that the response rate was low in several FEMS Schools.

The School of Genetics and Microbiology reported that they conduct a panel review with research students every March and September where each student is provided the opportunity to discuss their experience with three staff members who are not Supervisors.

2.3 Summary of best practice across the Faculty

- The School of Computer Science and Statistics piloted a scheme for double checking of the Senior Sophister results. This is now standard practise for Junior Sophister summer exams in Engineering (BAI).
- School of Biochemistry and Immunology have introduced more pre-practical assignments for their students.
- Schools are constantly improving their quality of teaching, including innovations such as flipped teaching and learning assistance programmes. The feedback from students is that the introduction of these methods has enhanced the teaching quality and student experience.
- FEMS is committed to the recruitment of Non-EU students. The Dean of FEMS is working closely with Global Relations, and with the Schools, to develop new processes to enhance and develop the recruitment of Non-EU students.
- The School of Computer Science and Statistics continue to use the survey application Qualtrics as a teaching and feedback mechanism for their students.

The Dean of FEMS conveyed that best practices are of the upmost importance for the Faculty and that sharing best practices should lead to an enhancement of quality across the Faculty.

2.4 Summary of issues to be escalated to College Level

All issues within their remit raised were dealt with at School level.

- By far the most common issue raised by students in a number of Schools is the sub-optimal quality of many of the teaching and learning spaces used by Schools within the Faculty. This includes particularly the Goldsmith Hall, which is unsuitable for lectures. Where possible Schools try to accommodate classes in appropriate spaces, but some classrooms are simply too small for increasingly large class sizes. Of particular concern is the lack of growth space

for Schools, especially when trying to recruit senior, world-ranked academics.
- Unhappiness was reported amongst students about lack of examinations after the first semester. The Faculty will continue to engage with the TEP on this issue.
- The slow and difficult recruitment process in place across College results in substantial delay to replacing/recruiting staff. This is particularly concerning when trying to recruit high-calibre researchers.

2.5 Faculty Projects / Initiatives

Thapar Initiative

Eight Thapar students attended College as part of the pilot scheme in 2015-16. An additional 8 students were recruited into Junior Sophister in 2016-17. The full complement of 40-50 Junior Sophister intake is scheduled to begin in 2017-18.

Trinity Education Project

The Faculty is leading the way with pro-active engagement with the requirements of the TEP. Several issues remain to be resolved, including the folding of direct entry courses into TR071 and the academic year calendar.

Deans Awards

Deans Awards recipients for Teaching and Innovation in 2015/16 include:

Awardee	Title	Summary
Jane Chadwick (Science Gallery) Shane Bergin (Physics)	Problem-Based Cooperative Learning in Undergraduate Physics Labs	This proposal aims to build on the successful application of problem-based cooperative learning in undergraduate physics labs by widening the range of tools and skills at the student's disposal. This will be done by working with MAKESHOP in conjunction with Science Gallery Dublin.
Jan Manschot (Mathematics)	Demonstration equipment	Demonstration equipment for the courses on classical mechanics (MA1241 and MA1242) for freshmen students in Theoretical Physics and Mathematics.
Catherine Rose (School of Natural Sciences)	Teaching Next-Generation Mapping with Unmanned Aerial Vehicles	Proposal for a new undergraduate module 'Remote sensing: Drones for Natural Sciences' that will provide strong foundational hands-on training for students to collect, process, and interpret UAV-acquired spatial data using a DJI Phantom 3 Professional quadcopter.

Awardee	Title	Summary
Mukta Prasad (School of Computer Science and Statistics)	Modernising Computer Vision Teaching	Modernise two modules in Computer Vision ('Computer Vision' (CS7008) and 'Augmented Reality (AR)' (CS7034) by making them more interactive, practical and hands on by: a) modernising the slides b) designing and implementing demos that help visualize the theory c) designing assignments that build from the demos and d) efficient automated assessment.
Noelle Scully and Paula E. Colavita - School of Chemistry	Development of online interactive training modules for the integration of blended learning approaches in the freshman chemistry laboratory	Proposal to use multimedia tools to develop online, interactive training modules for pre-practical training of students on key instrumental and advanced bench techniques in the chemical laboratory.

Enhancing the use and uptake of BlackBoard

Faculty-wide information on the use of and engagement with Blackboard to be collated by the Faculty Office in Q2 2017.

Closing the Feedback loop

A main focus for the Faculty in the coming year is the enhancement of the feedback mechanism to students and external examiners. The SU and GSU, to include their representatives on the FEC, will be included in any improvement programme discussions.

The Dean will request an invitation to a FEMS Student Reps meeting in Q2 2017, with the aim of providing a Faculty perspective on key issues of concern.

School Risk Register project

The School of Chemistry is participating in the piloting of the School Risk Register project, which aims to fulfil one of the Core Statutory QA Criteria of 'A system of governance that addresses risk'.

2.6 Update on issues outlined in previous years Annual Faculty Quality Report

- The issue of space, especially unsuitable lecture venues e.g. Goldsmith Hall, has been raised through several fora across the College.
  Update: The Faculty continues to engage in College-wide programmes, including the TEP and the Estates Strategy, to draw attention to these issues. However, there is no quick fix for addressing these sub-optimal spaces.
- The School of Chemistry has serious issues with overcrowding in laboratories which is an issue for accreditation by the Royal Society of Chemistry who require a set number of laboratory contact hours in the first 3 years of the Chemistry degree programmes.
  Update: The School is in negotiation with RSC to look at alternative options (such as including the unique safety training workshops and labs in physics/biology towards the minimum lab hours criteria).

- An ongoing issue for all Schools is the issue of timetabling. Visiting student in particular find it very difficult to agree a timetable due to clashes. There is a need for a College fixed timetable.
  Update: It is to be hoped that this would be resolved through the TEP, with which all FEMS Schools are engaging.
- Schools continue to experience difficulties meeting the timeframes for the return of assessed coursework of students (UG -20 days; PG 30 days).
  Update: The Schools concerned will continue to work on mechanisms and approaches to enable this requirement to be met, and we hope to see this appearing less frequently in student feedback as the procedure is bedded down.

3. APPENDICES -FACULTY AT A GLANCE

3.1   Summary of Course, Module and External Examiner Evaluations

School	Undergraduate		
	No.	Evaluated	Response rate
School of Biochemistry and Immunology	54	48	70%
School of Chemistry	41	41	100%
School of Computer Science and Statistics	105	105 (programme survey)	50%
School of Engineering	180	180	50%
School of Genetics & Microbiology	23	18	50%
School of Mathematics	57	57	50-70%
School of Natural Sciences	84	80	Over 60%
School of Physics	44	41 (3 practical modules assessed via interview)	Over 60%
Total	588	570	Good

School	PGT		
	No.	Evaluated	Response rate
School of Computer Science and Statistics	8	4	Good
School of Engineering	12	11	One reviewed by informal interviews with students twice yearly.
School of Mathematics	1	1	Good
School of Natural Sciences	3	3	High
School of Biochemistry and Immunology	N/A	N/A	N/A
School of Chemistry	N/A	N/A	N/A
School of Genetics & Microbiology	N/A	N/A	N/A
School of Physics	N/A	N/A	N/A
Total	24	19	Moderate

3.2   Return of UG External Examiners reports

Cohort	No. of Reports	No. not returned	% returned
Undergraduate	33	5	85%
Postgraduate Taught	21	3	86%

3.3   Summary of enhancements, best practise and repeat issues 2015-16.

Selected School enhancements in 2015-16:

- As many of the practicals in the School of Biochemistry and Immunology were reorganised into stand-alone modules, and as the School introduced 'flipped classrooms', the School focused on surveys for these modules in 2015-16.
- The School of Biochemistry and Immunology began the process of meeting individual moderatorship JS classes as a group with the course co-ordinators, lecturing staff and DUTL to obtain feedback on individual JS modules. This programme will be rolled out for selected modules (JS and SS years) for all of the degree programs run by the school. The School will work in partnership with the Student Partnership Programme proposed by the Education Officer of the Student's Union to promote student engagement in the feedback process.
- The School of Biochemistry and Immunology have introduced Prism software in practicals, which allows for the introduction of more pre-practical assignments and online support for data handling including worked assignments.
- The School of Physics switched from online to paper surveys in 2015-16, with a much higher response rate (> 60%) as a result.
- The School of Genetics and Microbiology convened a subgroup to focus on the findings of the report of the External Examiner for Human Genetics, with meetings to discuss and decide actions and the successful implementation of those actions for the academic year 2015-2016. All of the requested actions have been achieved.
- In the School of Engineering, feedback is provided via Student Liaison Committee meetings whereby the student representatives meet with year, stream and Departmental Coordinators chaired by the Director of Teaching and Learning. The Undergraduate Student Convenor is also a member of this committee and provides regular input.
- The external examiner in Engineering with Management queried why some of the tutors were from non-Engineering disciplines and were not as knowledgeable about the Engineering examination regulations as they may be. It was agreed that this issue be raised by the School with the Senior Tutor as it was applicable to students who transferred to the School from other courses.
- For the MSc in Bioengineering, the external examiner provided exceptional feedback, stating that "The standards of the programme are very high. The quality of the candidates is excellent, which is also reflected in the very high pass rates (one student dropping out this year). The bioengineering programme at TCD is probably the strongest programme I know; I don't know of any other European programme that yields the same scientific level of the master theses." In addition, the external examiner offered his "Congratulations to the academic and administrative staff for running an exceptional and continuously innovating program".
- The UG External Examiner (Prof Jos Vander Sloten) has twice recommended that Biomedical Engineering be a separate School as bioengineering students do not get sufficient attention compared to other engineering students.
- The School of Natural Sciences places high value placed on fieldwork by students, and is addressing the issue of funding for field trips particularly in the light of the Trinity Trust's decision to no longer fund field trip expenses.   The School have liaised with the Senior Tutor on this and are also looking at philanthropic funding.
- The School of Natural Sciences have implemented a School-wide protocol for moderation of sophister scripts.
- In the MSc in Environmental Science course, the External Examiner requested that, where

there was >10% difference in marks returned by 1st and 2nd markers for the research dissertation, that a 3rd marker should grade the submitted work before the External Examiner arrived. Despite a tight turn-around this request was achieved.

- Changes to the assessment of the modules following the external examiners feedback, notably in the School of Genetics and Microbiology who convened a working group to rejuvenate the course following feedback from the External Examiner, and School of Computer Science and Statistics where the weighting of the Final Year Project for the Computer Science and Business was raised to 20 ECTS credits as a result of the feedback from the external examiner.
- The School of Computer Science and Statistics has introduced the double checking of the School's modules in Junior Sophister summer exams in Engineering (BAI).

Best practise 2015-16:

- Schools are addressing student feedback by giving realistic time frames for self-study practical reports.
- Schools continue to make changes to the examination/continuous assessment balance, including bringing laboratory experiments in line with taught material.
- New informal learning spaces were provided in the Hamilton concourse and the upper level of the refurbished Bank of Ireland. The Faculty and the Schools will continue to liaise with the Estates Strategy to provide more spaces of this kind. However, it was noted that space is very limited across the Faculty.
- Several Schools have reduced timetabled hours to ensure students are not overburdened with coursework.
- Schools reported that a summary of improvements and adjustments is given to the external examiner each year and they have an opportunity to comment on whether their feedback was implemented and what they thought of the subsequent response.
- Details of new course content were sent to External Examiner well in advance of the visit.
- The School of Physics hold one Freshman and one Sophister Staff/Student Liaison Meeting per semester which is attended by class reps, staff year heads, the DUTL and School Administrator. Students are invited to submit items for the agenda and feedback is given to students on action taken on items after the meeting.
- The School of Physics conduct exit interviews for the whole Senior Sophister class each year when Moderatorship examinations are completed. This is particularly valuable feedback as the students then have a much better perspective than when they have just completed any particular module. Student comments are usually very positive in these interviews and feedback to individual students on their comments is immediate.
- In the School of Engineering, having discussed the external examiner reports at the School of Engineering Curriculum Committee, a formal response to the all of the reports received from the external examiners is prepared by the Director of Teaching and Learning (Undergraduate) at School level and will be communicated to each of the external examiners individually.
- The structure of the MPhil in Music and Media Technology ensures that a day has been left between all assignment submission dates so that no assignments are due on consecutive days hence relieving the pressure on the students a little
- Provision of dedicated student spaces, such as making a room available for students on the Project Management course before the lectures on Friday evenings for networking and facilitating discussion of their assignments.
- The School of Natural Sciences established a curriculum review sub-committee to review the

full content of the Masters in Development Practice course, make recommendations on enhancements, consolidation of modules, and introduction of new modules. Resultant actions were assigned to staff members with a timetable for implementation.

Repeat issues and escalations:
- The Faculty did not meet the Council criteria of evaluating all UG and PGT modules in 2015-16. During the FEC Special meeting on quality, Prof. Michael Brady (Director of Undergraduate Teaching and Learning in SCSS) presented an overview of the School's experience with using Qualtrics as a programme evaluation tool. Key to the success of the tool was generating a survey that used a simple, limited number of questions. There was widespread support towards broadening such an approach Faculty-wide. The Students Union proposed several amendments to the current system, including (a) assigning a small % of the module marks for completing the survey (b) conducting the surveys mid-module, so respondees receive feedback and the benefit of any resultant amendments (c) better use of School Convenors for providing feedback to the students (d) surveys to be centralised, as self-regulation by lecturers is not always successful (e) evaluations should be standardised. These proposals will be discussed in more detail with the Academic Secretary in the coming year, to include moving from module to course examination, standardised questions to allow for year-on-year trend analysis etc.
- The target of 100% return of External Examiners reports was not met in 2015-16. Following discussion at the special FEC meeting on Quality, it was acknowledged that issues relating to non-return of reports were in some part a failure of the system. The Quality Officer undertook to review the system.
- The issue of unsuitable learning spaces continues to be raised by several Schools. In particular, Goldsmith Hall is an unsuitable venue for lecturing as it is very difficult to hear lecturers due to the acoustics. Engagement on space will continue in 2016-17, in particular through the Estates Strategy led by the Bursar and the E3 project.
- The School of Chemistry has again reported issues with overcrowding in labs and the unsuitability of Goldsmith Hall for conducting lectures.
- Schools continue to struggle to return continuous assessment marks and feedback within the required College timeframe (20 days UG and 30 days PG).
- Chemistry reported issues with the workload imposed by the JS lab course.   Action was taken by the Head of Discipline and a report made to the Sophister Liaison Committee for onward feedback to the classes concerned.
- Scheduling imbalances in student timetables cannot be resolved with fixed timetabling. Schools cannot resolve this issue unless fixed timetables are introduced. Schools will continue to engage with the TEP to address this issue.
- Lack of staffing and resources, such as no non-pay allocations, continue to be raised. In particular, the slow and difficult recruitment process in place across College can see substantial delays to replacing staff.
- The use of Blackboard is not ubiquitous across all Schools and programmes. Additional information on the use and engagement with Blackboard to be conducted by the Faculty Office in Q2 2016.
- Resources are not available at a School level to individually assess every module. This function should be performed by central College.
- Issues persist around module enrolment issues, access to library issues, limited computer laboratory facilities and access.
- The external examiner for Electronic/Computer Engineering raised the issue of the

Departmental re-location to a number of different non-campus based sites and the difficulties for teaching that this may introduce. This fragmentation of Schools, and the resultant issues for students and staff, is common to most Schools in the Faculty.

- In the School of Engineering, access to computer laboratories is provided to Freshman students by other Schools as there are no dedicated Engineering computer laboratory facilities.

- Module enrolment date should be brought forward to the end of week 1 for students in the School of Engineering, as the current deadline of the end of week 3 is far too late as so much material has already been missed, taking into account that College Regulations that allows students to change/transfer between programmes within the first three weeks without impact on registration..

- Two External Examiners for the School of Natural Science identified that the breadth of module choice on offer is more limited as a function of the relatively small staff number within Geography. This has implications for the choice of module available to candidate in their final year, particularly if they have decided that they would like to specialise in either human or physical geography. Similarly resources constraints were identified by one External Examiner in Microbiology where the range of microorganisms the departments expertise covers in detail is somewhat limited by the number of staff and is likely to impact on the range of microbiological expertise Ireland is able to call upon in the future

Actions for 2015-16:

- As a key action for FEMS in 2016-17 is the enhancement of the feedback to students and external examiners.

3.4 Accreditation Cycle

Accreditation body	Name of Programme accredited	UG/PG	Last Accreditation Visit	Outcome achieved	Next Visit Due
Engineers Ireland	B.A.I x 6*	UG	March 2013	Accredited	December 2016
	B.Sc. in Engineering with Management	UG	March 2013	Accredited	November 2016
	M.Sc. programme	PG	March 2013	Accredited	2018/19 (tbc)
Engineers Ireland	Integrated Computer Science	UG	May 2012	Accredited	November 2016
	BAI/MAI Computer Engineering	UG/PG	March 2013	Accredited	November 2016
Institute of Physics	B.A. Moderatorship x 4*	UG	2011	Accredited	2017 (tbc)

Escalations and repeat issues

- In the School of Physics, accreditation was granted on the understanding that gaps missing in the core of Physics were filled, namely Optical Cavities in Theoretical Physics and Fundamental Forces and the Standard Model in Nanoscience. These have now been implemented, the latter in the current academic year.

Note:

- Programmes in the School of Chemistry (Chemistry TR071, Medicinal Chemistry & Chemistry with Molecular Modelling) are not currently accredited by the Royal Society of Chemistry Ireland, as they fail to meet RSC requirements for practical lab hours.

3.5 Quality Review Cycle

Quality Reviews in Academic Year	Type	Current Status
TR071 General science Course review March 2015	P	Implementation Plan approved. Appointment of Associate Dean of Undergraduate Science Education. USEWG engaging with TEP.
School of Chemistry 16-18 November 2015	S	Implementation plan approved by College Quality Committee
School of Computer Science and Statistics 15-17 Feb 2016	S	Implementation plan to be submitted to College Quality Committee in Jan 2016
Trinity College Institute of Neuroscience (TCIN) 25-27 April 2016	R	Review report presented to College Quality Committee. IP will be in 2017
Quality Reviews due next Academic Year	Nil	

*School (S); Programme (P); Research (R).

3.6 Progression, Retention and Completion Statistics

UG New Entrants retention data for FEMS (extract from Senior Lecturer's report 2014/15)

Course Title	Totals on Course	Outcome	Totals Total No.	Total %
Chemistry with Molecular Modelling	6	PROGRESSED SAME COURSE	4	67%
		REPEAT SAME COURSE		
		TRANSFERRED OTHER COURSE	2	33%
		NOT RETAINED		
Computer Science	94	PROGRESSED SAME COURSE	90	96%
		REPEAT SAME COURSE		
		TRANSFERRED OTHER COURSE	1	1%
		NOT RETAINED	3	3%
Earth Sciences	20	PROGRESSED SAME COURSE	17	85%
		REPEAT SAME COURSE		
		TRANSFERRED OTHER COURSE	3	15%
		NOT RETAINED		
Engineering	167	PROGRESSED SAME COURSE	154	92%
		REPEAT SAME COURSE	9	5%
		TRANSFERRED OTHER COURSE	1	1%
		NOT RETAINED	3	2%
Engineering with Management	23	PROGRESSED SAME COURSE	20	87%
		REPEAT SAME COURSE	2	9%
		TRANSFERRED OTHER COURSE		
		NOT RETAINED	1	4%
Human Genetics	18	PROGRESSED SAME COURSE	18	100%
		REPEAT SAME COURSE		
		TRANSFERRED OTHER COURSE		
		NOT RETAINED		
Information Systems	29	PROGRESSED SAME COURSE	24	83%
		REPEAT SAME COURSE		
		TRANSFERRED OTHER COURSE		
		NOT RETAINED	5	17%
Management Science and Information Systems Studies	37	PROGRESSED SAME COURSE	35	95%
		REPEAT SAME COURSE		
		TRANSFERRED OTHER COURSE		
		NOT RETAINED	2	5%
Mathematics	32	PROGRESSED SAME COURSE	29	91%
		REPEAT SAME COURSE	2	6%
		TRANSFERRED OTHER COURSE		
		NOT RETAINED	1	3%
Medicinal Chemistry	27	PROGRESSED SAME COURSE	22	81%
		REPEAT SAME COURSE	2	7%
		TRANSFERRED OTHER COURSE	1	4%
		NOT RETAINED	2	7%
Nanoscience, Physics and Chemistry of Advanced Materials	24	PROGRESSED SAME COURSE	22	92%
		REPEAT SAME COURSE	1	4%
		TRANSFERRED OTHER COURSE		
		NOT RETAINED	1	4%
Science (TR071)	304	PROGRESSED SAME COURSE	277	91%
		REPEAT SAME COURSE	10	3%
		TRANSFERRED OTHER COURSE	6	2%
		NOT RETAINED	11	4%

Course Title	Totals on Course	Outcome	Totals	
			Total No.	Total %
Theoretical Physics	36	PROGRESSED SAME COURSE	25	69%
		REPEAT SAME COURSE	4	11%
		TRANSFERRED OTHER COURSE	5	14%
		NOT RETAINED	2	6%
Grand Total	**817**		**817**	

Retention in UG courses in the Faculty is high, and meeting the College's Strategic Plan target of 90%. Where retention falls below that level, it is on small-intake courses where one student retiring from a course can have a significant impact on the retention rate.

3.7   Irish Survey of Student Engagement summary

The Irish Survey of Student Engagement (ISSE) measures student engagement with higher education, beyond that ascertained through student satisfaction surveys. A summary of the ISSE findings, as they pertain to FEMS is outlined below:

Key findings (College level):
- A total of 1,811 students across College responded to the 2015/16 survey. This produced an overall response rate of 22.8%, equivalent to 2014/15.
- When compared with other ISSE Universities, Trinity PGT respondents report that their highest form of engagement is in Supportive Environment i.e. attending important social, economic or political events or campus activities and their lowest is in 'Collaborative Learning' engagement in working with fellow students. Compared with ISSE Universities, Trinity is perceived as having lower engagement in collaborative learning.
- Over 80% of respondents across the three faculties report that their entire educational experience is good or excellent and would probably or definitely attend Trinity if they were to start over again.
- Three-quarters of the respondents (76%) reported that they regularly spend a significant amount of time studying and this is evident across all cohorts (YR1 74%, YRF 80%, PGT 74%).
- When asked about the frequency of making presentations in class or online, 29% of respondents state that they 'often or very often' do, 42% 'sometimes' do and 28% 'never' make presentations either in class or online.
- Respondents reported a lower score in Trinity when compared to ISSE Universities in the area of Quality of Interactions (TCD 34.7; ISSE Univ 37.0) particularly in their relationships with administrative staff and offices such as registry and finances (good-excellent: TCD 38%, ISEE Univ 50%).
- Over half of the respondents from all cohorts report good provision of social opportunities, well-being support and social activity attendances
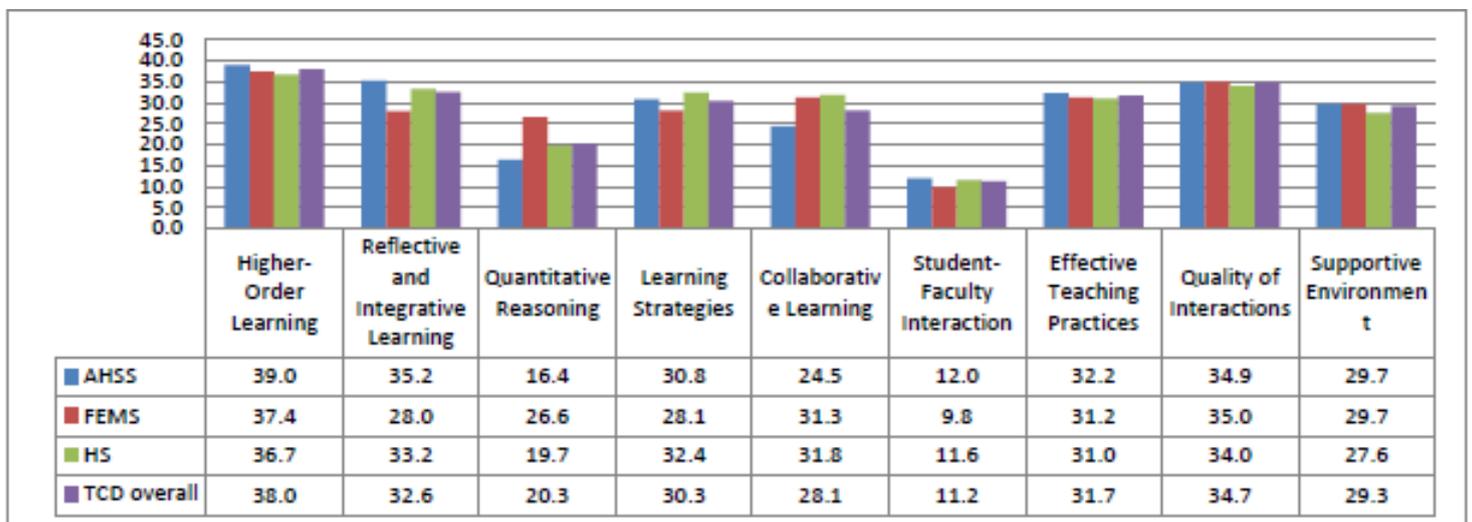
Key findings (FEMS):
- FEMS respondents totalled 524, equivalent to 2014/15. The respondent breakdown included 312 Junior Freshman, 163 Senior Sophisters and 49 PGT respondents.
- The key engagement competency with Trinity Junior Freshman respondents compared to other ISSE Universities is in the Quantitative Reasoning index i.e. critical thinking, interpreting data and forming decisions.
- As expected, all cohorts in FEMS rate reaching conclusions based on analysis of numerical information (Quantitative Reasoning and Collaborative Learning) as the key engagement competency, with scores remaining consistently high during undergraduate years.
- The Faculty showed lower scores in Reflective and Integrative Learning and Higher Order Learning than the other two Faculties. At 44%, FEMS shows the lowest level of reflective and integrative learning skills when compared with the other faculties (AHSS (61%) and HS (53%)).
- 43% of FEMS respondents report that they identify key information from recommended reading materials.
- The findings show that half of the overall respondents across FEMS (50%) shared their experiences with other students.
- 41% of FEMS respondents report that they 'often or very often' discuss and/or work with other students in revising for examinations
- Working with students on projects or assignments is key to the learning experience for FEMS Junior Freshman (56%). The same pattern exists with PGT respondents where FEMS liaise

more with other students in working on projects/assignments together (AHSS 41%, FEMS 64%, HS 37%).

- At a faculty level, HS respondents observed better teaching practice in their learning compared FEMS, particularly in the way the programme is organised (AHSS 36%, FEMS 35%, HS 81%).
- Over half of the respondents across College acknowledged that their newly acquired learning would influence their employability prospects. 48% of FEMS respondents across all cohorts stated that they acquired job or work related knowledge and skills, compared to 38% in AHSS and 72% in HS.
- Overall, the general satisfaction of students in FEMS improves from first to final year.

Extract from the ISSE report illustrates the FEMS scores in each ISSE category, compared to the other two faculties. FEMS is below the College average in five categories.

	Higher-Order Learning	Reflective and Integrative Learning	Quantitative Reasoning	Learning Strategies	Collaborative Learning	Student-Faculty Interaction	Effective Teaching Practices	Quality of Interactions	Supportive Environment
AHSS	39.0	35.2	16.4	30.8	24.5	12.0	32.2	34.9	29.7
FEMS	37.4	28.0	26.6	28.1	31.3	9.8	31.2	35.0	29.7
HS	36.7	33.2	19.7	32.4	31.8	11.6	31.0	34.0	27.6
TCD overall	38.0	32.6	20.3	30.3	28.1	11.2	31.7	34.7	29.3

3.8   PGR survey 2015-16

The Quality Office, with the cooperation of the Graduate Students' Union, piloted the PGR survey questionnaires with graduate research masters and doctoral students in November 2015, addressing the following key areas:
> (i) Experience of the postgraduate research programme;
> (ii) Professional and skills development;
> (iii) Funding;
> (iv) Overall satisfaction.

Key findings (College level):
- The survey attracted 445 responses from all Faculties, which accounts for 26% of research students enrolled in College in 2015/16.
- 80% of respondents reported they were very satisfied or satisfied with the research programme in Trinity;
- Over 70% of respondents were satisfied with the support provided by their supervisor with elements addressed in this question receiving the highest scores in the survey overall; e.g. supervisor skills and subject knowledge (4.16 /5); quality of supervisor feedback help direct research activities (4.12 /5), and availability of supervisors outside planned scheduled appointments (4.10 /5).
- 70% of the respondents reported access to suitable work space, computing resources and specialist resources. FEMS received the highest scores in this area with all three questions receiving a score of greater than 4.0 /5;
- 70% of respondents who taught or demonstrated had not attended any course to develop their teaching or demonstrating skills;
- Although all level 9 postgraduate taught modules are available to research students on the Ph. D Register, Ph.D. respondents reported low levels of satisfaction with the variety of taught modules available (2.90 /5);
- 32% of all respondents were self-funded, and FEMS respondents reported the highest level of stipend.

Key findings (FEMS):
- 38% of doctoral respondents to the survey are based in FEMS;
- In terms of understanding of 'requirements, deadlines and regulations for formal monitoring of progress' in their research programme 61% of respondents 'strongly agreed or agreed' that they understood the processes involved.   Knowledge of final examination procedures is strongest in FEMS.
- At a Faculty level, respondents from FEMS indicate the highest frequency of arranged meetings with supervisors with 65% meeting more regularly than once a month with their supervisor, compared to AHSS (21%) and HS (38%). This finding may be influenced by the tendency of students in STEM disciplines to work in close proximity with their supervisor as a member of a research group.
- The supervision experience was uniformly high across all Faculties.
- FEMS received the highest scores in terms of integrating students through the provision of a broader research programme than the Faculties of AHSS and HS.
- In terms of access to an appropriate research environment, FEMS received the highest scores (excess of 80% positive responses) for access to suitable work space, computing resources and facilities and specialist resources required for their research. These findings hold true across the Ph.D. and M.Sc. by Research cohorts.
- While FEMS respondents reported the highest rate in completing modules, they found the

modules less useful and were less satisfied with the variety of the modules available compared to the other two faculties.

- Opportunities to teach, demonstrate or in some way facilitate teaching varies across Faculties with 49% of AHSS and 44% of HS respondents reporting that they do not demonstrate, give tutorials or facilitate teaching, compared to 21% of FEMS.
- 67% of FEMS respondents indicated that they receive funding at the higher end of the spectrum i.e. €15-20,000, with 9% stating that are self-funded. SFI was the main source of funding for FEMS (34%) respondents.
- FEMS respondents reported higher levels of satisfaction (84% very satisfied or satisfied and 16% unsatisfied or very unsatisfied) when compared to the other Faculties.

3.9   Collaborative and Transnational Education Provision

Name and Location of Partner Institution	Partnership Status	Programme Title[1] or Award type and NFQ level	Type of Partnership:	Awarding body	Brief description of agreement
Thapar	Operational	NFQ Level 8 BAI in Engineering BAI in Computer Science	Articulation Agreement	Trinity	Large multifactorial partnership involving Schools of Engineering and Computer Science & Statistics
National des Sciences Appliquées (INSA) de Lyon	Operational			Dual	TCD Engineering and Engineering with Management students complete JS year in Trinity and are admitted to year 3 in INSA for one year (which is taken as equivalent to year 4 here). Students return to Trinity to do year 5 and then subsequent to this do year 6 in INSA. Currently are awarded BA BAI MAI and Diplôme d'Ingénieur de l'INSA de Lyon. (6 yrs in total)
Masters in Development Practice	Operational	UCD	Collaborative	Joint	Collaborative provision and joint award School of Natural Science.