



GRADUATE STUDIES COMMITTEE

Minutes of the meeting held at 9am on Thursday 18th May 2017
Boardroom, Provost's House

XX = Council relevance

- Present:** Professor Neville Cox, Dean of Graduate Studies (*Chair*)
Directors of Teaching and Learning (Postgraduate) as follows:
Professor James Quinn, School of Business
Professor Lucy Hederman, School of Computer Science and Statistics
Professor Ruth Barton, School of Creative Arts
Professor Michael O'Sullivan, School of Dental Science
Professor John Walsh, School of Education
Professor Richard Reilly, School of Engineering
Professor David O'Shaughnessy, School of English
Professor Christine Morris, School of Histories & Humanities
Professor Giuliana Adamo, School of Languages, Literatures & Cultural Studies
Professor Caoimhín MacMaoláin, School of Law
Professor Lorna Carson, School of Linguistic, Speech & Communication Sciences
Professor Andreea Nicoara, School of Mathematics
Professor Stephen Smith, School of Medicine
Professor Patrick Wyse Jackson, School of Natural Sciences
Professor Elizabeth Fahey-McCarthy, School of Nursing and Midwifery
Professor John Gilmer, School of Pharmacy & Pharmaceutical Sciences
Professor Louise Bradley, School of Physics
Professor Jean Quigley, School of Psychology
Professor David Shepherd, Confederal School of Religions, Peace Studies and Theology
Professor William Phelan, School of Social Sciences & Philosophy
Professor Virpi Timonen, School of Social Work and Social Policy
- Mr Shane Collins, Graduate Students' Union President (*Ex officio*)
Mr Martin McAndrew, Postgraduate Student Support Officer (*Ex officio*)
Ms Siobhan Dunne, Sub-Librarian for Teaching, Research and User Experience (in attendance *Ex officio*)
Ms Elisa Crespo Miguez, Graduate Students' Union Vice-President (*Ex officio*)
Ms Helen Thornbury (Office of Dean of Graduate Studies) (*Ex officio*)

Apologies:

- Professor John J Boland, Dean of Research (*Ex officio*)
Directors of Teaching and Learning (Postgraduate) as follows:



Professor Richard Porter, School of Biochemistry and Immunology
Professor Dónall Mac Dónaill, School of Chemistry
Professor Seamus Joseph Martin, School of Genetics and Microbiology

Ms Helen O'Hara, Information Technology Services Representative
(in attendance *Ex officio*)

Ms Patricia Callaghan, Academic Secretary, CAPSL Representative
(*Ex officio*)

In attendance:

Ms Ewa Sadowska (Trinity Teaching and Learning),
Prof. John Gormley (School of Medicine)

Secretary (*Ex officio*)
for item GS/16-17/110

GS/16-17/108 Minutes of 20th April 2017

The minutes were approved by the committee as circulated.

The Dean noted that, whereas this was the last official committee meeting of the academic year, it would be necessary for a sub-group of the committee to meet in June to consider recently submitted calendar changes (*Re B7* below).

GS/16-17/109 Matters Arising

Re: GS/16-17/76 AOB

(vi) The Graduate Students' Union President noted that the Department of Education and Skills had confirmed that all postgraduate students including on taught and research programmes could apply for a state grant for next year, covering fees and maintenance, subject to eligibility criteria. He undertook to pass on to the DTLPs the official correspondence the following day for the grant to be advertised in Schools.

Re: GS/16-17/91 A new MSc course proposal in Aging Health and Wellbeing in Intellectual Disability: The Dean advised that the course proposal had been sent out to an external reviewer.

Re: GS/16-17/92 Research Supervision Policy: The Dean advised that Council had approved the policy in May. He noted, however, that the issue of ensuring best practice in research supervision would, no doubt, be an ongoing issue for the committee.

Re: GS/16-17/93 Advertising and marketing of postgraduate taught programmes: The Dean advised that he had brought the concerns collected during his School visits throughout the year to the planning group which considered them against possible resource implications.

Re: GS/16-17/95 Postgraduate Studentship Model: The Dean thanked the members for their feedback and advised that he would circulate a document outlining the proposed changes to the studentship model due to commence in 2018/19 and then to be reviewed after two years. In particular, he noted that, in a change from



what had been mooted at the March 23 meeting of the GSC, those 1252 studentships that would *not* be brought under the new model, would be distributed to faculty deans on the same 'pro-rata' basis as was currently the case (that is, by reference to the number of PhDs from within a particular faculty which had been submitted, examined and approved by University Council within the previous academic year).

Re: GS/16-17/99 A new MSc course proposal in Clinical Dentistry (Top up) The Dean advised that the course had been sent out for an external review.

Re: GS/16-17/100 A new Postgraduate Certificate course proposal in Quantitative Methods and Data Analysis for Healthcare: The Dean advised that the course had been sent out for an external review.

Re: GS/16-17/101 A new MPhil course proposal in International History: The Dean advised that he had been still in the process of identifying an external reviewer for the course proposal.

Re: GS/16-17/102 A new Postgraduate Certificate course proposal in Fintech Innovation & Entrepreneurship: The Dean advised that the proposal would be considered by the committee in September.

Re: GS/16-17/103 Student Partnership Agreement: The Dean advised that Council had approved the document in May and that it had subsequently been signed.

XX GS/16-17/110 A new online Postgraduate Diploma course proposal in Clinical Exercise (Top up and stand-alone)

The Dean welcomed Prof. John Gormley (School of Medicine) to speak to the circulated document which was taken as read. Prof. Gormley provided a brief outline of the course, and explained that the proposed Postgraduate Diploma was a continuation of an already existing online Postgraduate Certificate in Clinical Exercise which had commenced in September 2015 with twenty two students and fifteen students enrolled the following year. Student feedback collected via online surveys and from the 2015/16 graduates suggested two areas of improvement. Firstly, some students commented on the lack of practical applications of taught material on the course, and suggested that short on-campus practical sessions developing key clinical skills would greatly improve the course. Secondly, a large number of email queries from potential applicants have highlighted the desire for further postgraduate training at a postgraduate diploma level. It is in response to these two issues that the proposed postgraduate diploma course was developed. Prof. John Gormley underlined that providing additional hands-on practical skills training and the option of a higher level of postgraduate qualification, would increase the value and demand for Trinity's course amongst early career clinicians.

In a discussion which followed a number of issues were raised. In response to a query asking when a decision would be made not to run a course if the minimum number of applicants were not likely to be met, Prof. Gormley clarified that for the



first three years the course would be run with as many applicants as possible, and the minimum threshold referenced in the proposal document should be taken as a measure for assessing the viability of the Course after the three year period. It was suggested that the course could be offered as an additional complementary stand-alone qualification on Trinity's structured PhD, and some of its modules might also inform an undergraduate offering. Prof. Gormley clarified the multiple entry routes to the Postgraduate Certificate and the Postgraduate Diploma. It was noted that direct entries to both the Postgraduate Certificate and the Postgraduate Diploma would be offered and that a top up to those who completed the Postgraduate Certificate would constitute a 2nd year part time delivery of the Postgraduate Diploma. The award of the Postgraduate Certificate in Clinical Exercise would need to be rescinded upon completion of the Postgraduate Diploma Top up as both courses are Trinity's, and the latter is understood as a continuation of the former.

A comment was made that the committee would have welcomed to see a financial statement as part of the course proposal submission, and the discussion was concluded by recommending that, subject to the inclusion of the financial statement, the proposal should be sent for an external review.

XX GS/16-17/111 Data curation in a research degree: the roles of supervisor and student

The Dean invited Prof. Stephen Smith (DTLP in the School of Medicine) to speak to his circulated *memorandum* which was taken as read. Prof. Smith referred to the meeting of the GSC in March when the issue of data management and ownership had been first raised in relation to the Research Supervision Policy (GS/16-17/92). He clarified that his *memorandum* had been discussed at the School of Medicine's Postgraduate Teaching and Learning Committee and also the School of Medicine Executive, and that it had met with general approval. Prof. Smith noted that Trinity had no policy in place to ensure that raw data, generated by a research student, were faithfully deposited and to ensure that that data would continue to be available to the student's supervisor. He explained that in order to publish in the area of medicine, authors must have access to raw data to substantiate the scientific claims made. It would therefore seem essential for the supervisor to be a custodian of data that emanate from the scientific endeavors of a student's thesis. Prof. Smith emphasized that any policy should recognize the enormous role of the student in data acquisition whilst also providing for methodologies to ensure the long-term accessibility and storage of data in College. A future policy might also stipulate or recommend that students receive training in good data management practice, and also provide for a permanent location for the storage of data, accessible by both student and supervisor. A checkpoint should exist to ensure that data had been faithfully deposited in an accessible manner.

In a discussion which followed a general concern was expressed at the currently unclear data ownership and data management practices varied greatly in different Schools. A query was raised about a legal ownership of research data generated by the research student. The DTLP in the School of Physics referred to frequent situations locally where some PhD graduates attempt to continue working independently on the software/modelling programme/new materials/new devices



developed as part of the thesis under the supervisor's guidance, when they leave College, and find it objectionable when they are not allowed to. It was noted that in the area of natural science data curation should also cover dealing with specimens. The issue of co-publication was also commented on. Members commented that the student-gathered data should be fully accessible to the supervisor but also that the supervisor must, in turn, publish the data with correct attribution. A concern was expressed at the ever-more frequent situations where students were refusing to open up their data to the supervisor. Members were in agreement that a new policy be put together to regulate the area of data curation, that work on it should be carried out in a collaborative and considered manner involving academic and research student representatives, that bespoke training be available to research students and that checkpoints be put in place to ensure that raw data has been fully deposited in a repository shared with the supervisor before the thesis submission. It was noted that unwillingness of some research students to share their data might be underpinned by their anxiety about the commercial viability of the data used post-thesis by a third party. It was also commented that a definition of data with respect to the arts, social sciences and humanities in general be formulated.

The committee approved three recommendations made by the Dean as follows:

- (i) the Dean would set up a steering group to produce a policy in relation to data curation in the context of postgraduate students generally;
- (ii) a new introductory booklet provided to all incoming PhD students would include a section on data curation;
- (iii) a new generic, structured PhD module (focusing on different aspects of the life cycle of a PhD student) to be introduced would include a section on data management and curation.

XX GS/16-17/112 Review of dissertation options for postgraduate courses

The Dean welcomed Prof. Jim Quinn (Trinity Business School) to speak to his circulated *memorandum* which was taken as read. Prof. Quinn explained that, as the Trinity Business School (TBS) needed to compete effectively in a global business school environment, it became necessary to re-examine the requirements for a 30 ECTS dissertation necessitated within current taught MSc structures. The School's postgraduate student population was shortly expected to reach a thousand by the end of the expansion period. Managing such a large cohort across the diversified postgraduate programme portfolio with multiple learning objectives would require flexibility and critical resource management skills. In order to face the challenges in the "dissertation space" the School had looked to its own successful MBA programme along with the emerging practices implemented by exemplar university-based business schools at institutions such as Oxford, Cambridge and Imperial College London. The TBS was therefore proposing re-evaluation of the thinking behind the learning objectives of the "dissertation space" on the Masters courses with a view to creating alternative learning outputs. After a broad outline of the current dissertation requirements within the MSc suite in the TBS, and its alternatives available in the Saïd Business School at Oxford, the Judge Business School at Cambridge and in the Imperial College London, Prof. Quinn concluded that the Trinity Business School wished to propose that, whereas the 30 ECTS standard dissertation model would remain as an option, postgraduate students would also be



offered alternative methods of fulfilling the ‘dissertation space’ including team-based and individual projects, and experiential learning outputs, consistent with innovative Masters programmes in a competitive international environment. Such an approach would broaden the range of learning opportunities and skills’ development for the School’s large international student cohort, and optimise the ability of the TBS to manage its growing postgraduate activity in a more effective manner in the best interest of both student and College.

In a discussion which followed a query was raised whether there was a definition of what constitutes an MSc in Trinity (that is, whether it entailed writing a 30 ECTS dissertation), and the Dean commented that there was a conventional practice in place but probably no definition. DTLPs in many Schools admitted that a traditional dissertation was not always the most appropriate learning output for their discipline (e.g. Education and Pharmacy). The committee were therefore willing to consider Prof. Quinn’s proposal within a broad spectrum of all the MSc courses across College, and wondered if the existing regulations were sufficiently flexible to accommodate alternatives within the “dissertation space” to allow Schools to make their own decisions to suit the pedagogical learning outputs best applicable to their disciplines, and ensure equivalent rigorous assessment standards.

It was agreed to return to the issue in September, with a view to bringing a substantive proposal before University Council in October. Prof. Quinn undertook to provide for the September meeting a specific proposal for a change involving alternative modes of assessment to the dissertation on a chosen postgraduate course in the School while the Dean agreed to provide a proposal for a general principle of dissertation substitution applicable throughout College. It was noted that, even if Council endorsed the general proposal to allow Schools such flexibility, any specific change to individual course options would need to be approved by the Graduate Studies Committee under Calendar part III changes.

XX GS/16-17/113 Dean of Graduate Studies’ Annual Report 2015/16

The Dean noted that the 2015/16 report was the last one to be presented in the established format and that, from next year, Academic Registry would produce a report on admissions and other data, and the Dean’s report would represent a commentary on the Academic Registry’s report. He drew the members’ attention to the absence of admissions figures for 2016/17 to be reported on separately by the Academic Registry which would be responsible to produce reports on statistical data which the area generates. The Dean went through the Sections commenting on issues of particular interest.

Re Section 2 Office of the Dean of Graduate Studies

The Dean noted that page 4 gives details of the functions of the Office. He underlined that the Office continued to work closely with staff from Trinity Teaching and Learning on all the areas within its brief and with the Academic Registry.

Re Section 3 Graduate Studies Committee

The Dean noted that the section presents brief highlights from the committee meetings which include the Recognition of Prior Learning Policy, the Postgraduate Research



Student Survey run for the first time in 2015/16, the Postgraduate Modularisation Pilot Project still running, and the development of the Policy on Remote Research Supervision and on Plagiarism.

Re Section 4 New Course Proposals

The Dean noted that the committee had approved two strands and eight new courses including a joint Masters course with UCD.

Re Section 5 Processing and Admissions: Postgraduate Student and Course Numbers

The Dean noted that page 9 gives information on postgraduate student numbers and drew the members' attention to an increase of just over 7% in the number of students in 2015/16 with 62% of new entrants coming from outside of Trinity. The Dean underlined that Trinity should continue to target its best and brightest final year undergraduates for postgraduate studies.

Table 2 on page 10 illustrates an increase in Trinity's research student numbers which shows that whilst they were not back at the level of 2012/13 the decrease of 2014/15 had been reversed. This table also illustrates the continuing growth in part time students across taught and research programmes.

Appendix 4 on page 12 detailing the nationality of Trinity's students shows an increase across the number of nationals from Africa, Asia and the Americas evidencing that the efforts of the Global Office were coming to fruition, and a slight increase in Irish nationals.

Table 3 on page 13 presents a breakdown of students by gender showing that almost 60% of Trinity's postgraduate students are females, and that there has not been significant change over the past number of years.

Figure 3 on page 17 illustrates a slight decrease of 4.5% in the number of Masters courses run in 2015/16 in comparison to the previous year. The Dean explained that increasingly, entry to some courses might be suspended for a given year for academic or resource-related reasons. Additionally, some courses might only have an intake on a biennial basis. There had been a 12% decrease in the number of courses run since 2013/14.

Re Section 6 Taught Postgraduate Courses – Overview of Student Numbers

The Dean noted that this overview of student numbers on Trinity's courses in 2015/16 illustrates that sixty courses (42%) across the three faculties were run with fewer than ten students. This constitutes an improvement on the previous year when 49% of courses were running below capacity. The Dean suggested rationalising courses no longer financially viable or academically relevant and noted that many of the Schools that he had visited were actively engaged in this process.

Re Section 7 Maintenance of Academic Quality

The Dean noted that the section presents information on the number of taught course external examiners who have returned their annual and final results. In March 2017 when the data was generated more than half of the 2015/16 examiners' reports



remained outstanding. The Dean emphasised that it was essential to monitor the issue for QA purposes.

Appendix 5a on page 53 lists external examiners on all postgraduate courses for Council approval while Appendix 5b on page 66 lists External Examiners for research degrees by Faculty in 2015/16.

Page 20 provides information on the results of research degree examinations. The majority of candidates (80%) received a result of "Pass subject to Minor Corrections". Almost 10% of candidates were "referred for major revisions and re-examination" which was a slight increase on the previous year. There were 9 recommendations for awards of lower degree and six research theses were failed where the candidates lodged appeals. The Dean noted that was a slight increase on the previous year and would need to be closely monitored.

Figure 5 on page 21 illustrates the length of time that research examinations take from first thesis submission through to approval by the Higher Degrees Sub-committee of Board and Council. The majority of research examinations were completed within 7 to 12 months which was similar to the proportion of the previous year. The Dean noted that the research examination process continued to be manual but with the recent completion of the Academic Registry Enhancement Programme and the research examination module going live in SITS improvements should take place.

Re Section 9 Postgraduate Admissions Data

The Dean noted that postgraduate admissions data had been part of the Dean's Annual Report since 2004 but the information would be published by the Academic Registry as part of its annual reporting.

Re Section 10 Founding Sources

This section presents founding sources for doctorate, research Masters and taught Masters students. The Dean noted that the section illustrates that over half of doctoral students were funded. Faculty of Engineering, Mathematics and Science continued to have the highest proportion of funded students with 75% of their research students in receipt of some financial support. In comparison, only 33% of PhD candidates in the Faculty of Arts, Humanities and Social Sciences receive some funding. Only just under 9% of taught Masters students receive mainly SUSI support.

The discussion which followed focused on the issue of external examiners' not returning their reports which prevented the Schools from receiving substantive feedback necessary to improve the academic quality of the courses on offer, and on the issue of limited funding for postgraduate students. A correlation between the number of students and the level of funding was commented on as was the anxiety that a further increase of postgraduate taught fees might make taught courses elitist and beyond the reach of an average applicant.

The Dean thanked Nicola Byrne from Academic Affairs in Trinity Teaching and Learning and Helen Thornbury for their work on the Report.



GS/16-17/114 Postgraduate students and mental health concerns

This item was taken together with GS/16-17/115 on Structured PhD changes. The Dean reminded the members that because of time constraints, there had been no time to discuss the item fully at the meeting in March (GS/16-17/94). He noted that concerns had been expressed both in Trinity and at national and European fora about increases in instances of research students suffering from mental health difficulties during the course of their studies. He indicated that there was no certainty whether the figures for mental health concerns amongst PhD students reflected a specific problem for this cohort or instead simply reflected normal per capita mental health problems in the population generally. However, he wondered if there were specific aspects of PhD study likely to generate those concerns. The Dean proposed to include a session on mental health issues on a new generic module to be added to the portfolio on the structured PhD from next year.

GS/16-17/115 Structured PhD changes

The Dean explained that recent surveys of PhD students indicated dissatisfaction with the taught components of the structured PhD. He proposed to sharpen up the focus of the structured PhD in Trinity by introducing two new generic modules from the second semester in 2017/18. The first module would focus on student careers while the second one would be on issues affecting the life cycle of a PhD student from admission to graduation including data curation, plagiarism, regulations, mental health and publication. Both modules would involve input from external speakers. The Dean asked the DTLPs to let him know what specific structured PhD modules their Schools had currently on offer as it was not his intention to compete or replace same but to complement them.

GS/16-17/116 Quality Review of Postgraduate Procedures

The Dean advised that the Office of the Dean of Graduate Studies would participate in an external institutional review of postgraduate procedures to take place in November 2017. The review will be supported by the Quality Office, and self-assessment document would be produced by the Dean and Trinity Teaching and Learning. The Dean thanked Professors Reilly, Morris and O'Sullivan for agreeing to work on a steering group in relation to this process.

GS/16-17/117 Graduate Studies Committee self-evaluation survey 2016/17

The Dean informed the members of the annual self-evaluation requirement for each principal Committee in College and invited them to complete this year's online survey of the Graduate Studies Committee by 1st July.

GS/16-17/118 AOB

The committee approved the Dean's recommendation that from next year the Graduate Studies Committee meeting in March would be the last meeting during the academic year when new course proposals due to commence the following September could be brought in for consideration.

The Dean thanked Ewa Sadowska and Helen Thornbury for their support throughout the year for the Graduate Studies Committee and the Office of the Dean respectively. The Dean also thanked all the members for their pro-active participation



in this year's meetings and for the individual help which many of them had provided to him, and extended a special farewell greeting to the members retiring from the committee, and in particular to Professor Fahey-McCarthy who would be retiring from College.

The Dean noted that he and Prof Gilmer, along with the University Dean of Development would take part in the Wicklow 200 cycle in June. They would be doing this on a sponsored basis to raise funds for a PhD studentship, for a student in financial need. The monies raised would be donated to a department (to be passed on to a student) on a 'lottery basis', but as a condition for a department to be eligible for this lottery, it was asked to donate €100 to the sponsorship, thereby hopefully increasing the overall sum raised. The Dean asked members to spread the word about the event and to encourage generosity. Details of how to sponsor the intrepid cyclists would be circulated shortly.

Section B for noting and approval

XX Re B1. Calendar changes 2017/18 for validated courses from Linked Providers

The committee approved the proposed Calendar changes for 2017/18 for postgraduate courses submitted by the Marino Institute of Education and the Royal Irish Academy of Music.

XX Re B2 A new module: STEM Education Research and Communication within Professional Doctorate in Education – a memo from Prof. Colette Murphy (School of Education)

The committee approved the proposed new module *STEM Education Research and Communication* to be added to the professional D.Ed. programme, and the resulting Calendar changes for 2017/18.

XX Re B3 Three new modules to be added to Postgraduate Certificate in 21st Century Teaching and Learning – a memo from Prof. John Walsh (School of Education)

The committee approved the proposed three new modules *Web Technologies*, *Developing Computer Systems* and *Advanced Text-Based Programming* to be added to the Postgraduate Certificate in 21st Century Teaching and Learning from 2017/18. There were no resulting Calendar changes for 2017/18.

XX Re B4 Changes to Postgraduate Certificate in Creative Thinking, Innovation & Entrepreneurship – a memo from Ruth Kearney, Business Development Manager (Innovation Academy)

The committee approved the proposed changes including the introduction of a new module *Career Pathways & Returning to Work (Returners)* from 2017/18, the stipulation that any modules within the Postgraduate Certificate in Creative Thinking, Innovation & Entrepreneurship (DPCIA-CTIE-1P09) be delivered in any sequence depending on the availability of teaching staff, and that all the six modules become available as stand-alone modules to facilitate continuous professional development (CPD) of participants outside Trinity interested in taking them, and resulting Calendar changes.



XX Re B5 Revised MBA Configuration – a memo from Prof. Jim Quinn (DTLP) and Mr Michael Flynn MBA Programme Director (School of Business)

The committee approved the revised MBA configuration resulting in the reduction of credit volume from the current 150ECTS to 120ECTS. The current ECTS load was deemed too high by accreditation bodies and the configuration was deemed too complex to support a scaled MBA portfolio. It was therefore necessary to reduce the credit load and re-configure the programme in order to create a flexible framework to achieve comparability with other leading MBA offerings. The committee noted that programme level and individual module Learning Outcomes would not change as a result of the restructuring process but that the current AACSB and EQUIS accreditation processes would require that an audit of the programme and its module outline be carried out in order to demonstrate that existing Learning Outcomes are aligned with the delivery protocols that are required by TBS's new Assurance of Learning systems. When drafting the College Calendar entry for 2017/18 the TBS was mindful of the fact that a restructuring of the programme was in hand. As such the submitted Calendar Changes for the 2017/18 academic year were broad and permitted a flexibility which means that no reconfiguration of the current submission is required with the proposed MBA changes.

XX Re B6 Change to An Ghaeilge mar Mheán Teagaisc/Irish as a Medium of Instruction (LI7894) Module – a memo from Prof. Lorna Carson (SLSCS)

The committee approved an amendment to one of the elective modules *An Ghaeilge mar Mheán Teagaisc/Irish as a Medium of Instruction (LI7894)* to be reduced from two term to a one term delivery, on the suite of Masters courses including (i) Linguistics, (ii) Applied Linguistics and (iii) Speech and Language Processing in the School of Linguistic, Speech and Communication Sciences, and the resulting Calendar changes for 2017/18.

XX Re B7 Calendar 2017/18 changes from various Schools

The Dean advised that the outstanding Calendar changes for 2017/18 would be deferred to be considered at a special meeting in mid-June by a self-selected sub-committee of the Graduate Studies Committee.

Section C for noting

Re C1 The committee noted the Minutes of the Marino Institute of Education, Associated College Degrees Committee (MIE ACDC) of 8 February 2017

Re C2 The committee noted the *Careers Advisory Service, Career Management System - steering group notes* from March 2017.

There being no other business, the meeting ended at 11.30am.

Prof. Neville Cox

Date: 18 May 2017