

Quality Assurance / Quality Improvement
Programme for Academic Units
2005-2006



School Quality Improvement Plan

School of Mathematical Sciences

October 2006

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1. INTRODUCTION

The School of Mathematical Sciences sees the Peer Review Group report as being helpful and timely, coming at a crucial moment in its development. Accordingly, the drafting of this Quality Improvement plan was undertaken in a positive spirit.

The School Quality Committee met repeatedly for intensive working sessions during September and October 2006. This resulted in a first draft of the plan, which was presented to the School as a whole and duly amended. The Head of School wishes to put on record his appreciation of the cooperation given by all of his colleagues in producing the present document.

We note that the Director of the Quality Promotion Unit states that "The School (and the University) are required, under the Universities Act (1997) to implement the recommendations of the Report, unless they are unreasonable or impractical". For its part, the School of Mathematical Sciences is fully committed to acting on the findings of the Peer Review Group; this plan is formulated in the explicit expectation that a matching commitment exists at Faculty and University level.

2. RESPONSE TO RECOMMENDATIONS IN THE PEER REVIEW GROUP REPORT

Recommendations for Improvement for SCHOOL/UNIT/CENTRE

The following notation is used in the recommendations for improvement.

P1: A recommendation that is important *and* requires urgent action.

P2: A recommendation that is important, but can (or perhaps must) be addressed on a more extended time scale.

P3: A recommendation which merits serious consideration but which is not considered to be critical to the quality of the ongoing activities in the Unit.

Additionally, the PRG indicate the level(s) of the University where action is required:

A: Administrative Unit

G: Group Action

U: University Executive/Senior Management

S: School

F: Faculty

O: OVPR

Organisation and Management:

	Addressee	Priority	PRG Recommendation	Response
1	U	P1	Under the current rigid promotional policies it is impossible for Ms. Karen O'Shea to advance her career within the school. It was clear to the Review Group that the loss of her expertise and commitment to the School would damage the School. It is recommended that promotional policies be modified to allow the promotion of holders of	If the Dean of the Faculty agrees with the Head of School that there is a requirement for a higher grade in this particular area, then a position should be requested through Budget Committee in the first instance. The promotional policies are part of a Union agreement and

	Addressee	Priority	PRG Recommendation	Response
			school secretarial posts to a higher grade or level of appointment, commensurate with the personal skill and qualifications exercised.	have served the University well over time.
2	S	P1	It is recommended that the development tasks which will necessarily arise during the term of the next headship should be identified and prioritised.	<ol style="list-style-type: none"> 1. Redesign our undergraduate degrees, with particular attention given to finding a viable successor to the BSc. in Mathematical Sciences. 2. Resolve our accommodation problem, either through a suitable relocation or otherwise, in order to obtain sufficient space for our planned expansion. 3. Obtain funding for the Mathematics Learning Centre on a permanent basis. 4. Obtain sanction for new members of staff in line with our increased recruitment of students. 5. Gain exemption status for our Graduate certificate in Actuarial Science. 6. Upgrade the status of our permanent member of administrative staff in line with her expertise and her key contribution to the smooth operation of the School. 7. Rationalise teaching so as to avoid unnecessary duplication of modules. 8. Design and progress through the accreditation process a Graduate Certificate in Actuarial Mathematics, to serve as a conversion course for graduates of Mathematics and other numerate disciplines wishing to gain exemptions

	Addressee	Priority	PRG Recommendation	Response
				from the Core Technical examinations of the Institute of Actuaries. 9. Extend the GCAS programme to a second year covering the higher exemption subjects.

Programmes and Instruction:

	Addressee	Priority	PRG Recommendation	Response
3	S	P1	It is recommended that the proposed fundamental review and redevelopment of the MS degree programme be progressed urgently.	This review is currently taking place and should lead to a re-configured degree recruiting in September 2008. The new programme will require vigorous marketing and advertising.
4	SU	P1	It is recommended that the entry point level for the FM should not be allowed to fall below 500, even if in the short term this reduces the numbers of students entering the course.	The redesign of our teaching portfolio will lead naturally to a high-point intake in the Actuarial Mathematics programme; the cooperation of the Faculty and the University authorities will be necessary for a smooth

	Addressee	Priority	PRG Recommendation	Response
				operation of the recruitment process. University senior management will work with relevant staff at School and Faculty level on this issue
5	S	P2	It is recommended that the School should drive the accreditation process for the mathematics stream of the Science Education degree	This stream has been accredited by Academic Council and the revised Science Education degree, with the mathematics stream, will appear in the CAO handbook and online material for intake in 2007-08. The School's Teaching Convenor and Service Teaching Coordinator are processing the application to the Department of Education to ensure that the new degree is approved by the Teacher Registration Council.
6	S	P3	It is recommended that the School should consider the provision of further education courses for secondary school mathematics teachers.	This item is being considered along with other mathematics education initiatives as a possible strand of an inter-institutional application under the heading of a National Mathematics Teaching and Learning Network to the HEA's Strategic Innovation Fund. The item is also being pursued in collaboration with colleagues in the University Designated Research Centre CASTeL (Centre for the Advancement of Science Teaching and Learning).

Scholarship and Research:

	Addressee	Priority	PRG Recommendation	Response
7	S	P1	It is recommended that the School should develop a strategic plan for research and adopt a proactive approach to locating or creating research opportunities. This requires familiarity with the staff activity in research and scholarly publication, applications and awards of grants or contracts, postgraduate supervision, and external research collaboration, and the identification, through consultation, of untapped opportunities. The introduction by a Research Officer of a targeted and sustained programme of monitoring funding opportunities and matching them to academic staff could prove to be very positive and should be considered.	<p>The strategic plan will be completed by June, 2007. The rather generous timescale is to allow enough time for full discussions of priorities and to gain full buy-in from the department as a whole.</p> <p>The Office of the Vice President for Research currently do an excellent job of informing academic staff of funding opportunities. The Research Convenor will highlight the most recent research opportunities received from the OVPR at each School meeting.</p>
8	S	P2	It is recommended that appropriate levels of postgraduate supervision/ grant applications/publications should be identified for the School as a whole; the choice of these levels should be informed by the performance of other mathematics departments in Ireland and Europe.	This is currently being implemented. It is, however, not realistically possible to obtain reliable statistics about the performance of other mathematics departments in Ireland and Europe, in particular in graduate supervision and grant applications. This will be done on a best-effort basis.
9	S	P3	It is recommended that the School instigate a process for semester-long "sabbaticals" from teaching. The scheme could concentrate on (a) those staff who have demonstrated, by past record and the	The School is in favour of this scheme. However, due to the budgeting system currently used by the University, the staffing level in the School is too low to do this in an

	Addressee	Priority	PRG Recommendation	Response
			submission of a research programme, an ability to benefit from such leave and/or (b) staff who need to develop new skills appropriate to new areas of teaching or research.	effective way. It is, however, recognised by the School to be international best practice and we look forward to the University's collaboration in making this proposal a reality. University management suggest that advice on this issue be sought at faculty level in the first instance. It should also be noted that the university budget model is currently under review. The proposal is that any new model would take account of the HEA weightings and the implication of this for Faculty budgets and staffing levels will be reviewed with Deans of Faculty.
10	S	P3	It is recommended that the School improve its research visibility on web pages (web pages can lead to increased research contacts and postgraduate applications), circulate posters on research opportunities to all departments in Ireland, and continue presentations on research opportunities in DCU.	Both of these suggestions are currently being implemented and it is intended that posters will be circulated to departments with which we have contact throughout the EU, as well as to all departments in Ireland.

Social and Community Service:

	Addressee	Priority	PRG Recommendation	Response
11	S	P1	It is recommended that the School consider the appointment of a member of staff as a Schools Liaison officer, focusing in particular on secondary schools within the university's catchment area.	The School is keen to carry out activities in this area, and indeed does so (e.g. Maths Week, Science Week). The School collaborates with the Faculty and the University in this regard. Furthermore, the School has at times had a dedicated Schools Liaison Officer. However this officers remit has not been clear, and nor has their relationship with the corresponding University officers been clarified. A proposal will be brought to the School to reinvigorate and expand this role, and the School will seek to establish how a Schools Liaison Officer can best operate within the Faculty and University context.
12	S	P3	It is recommended that the School continue to develop its links with the actuarial profession. This could potentially include more participation in the meetings and activities of the professional bodies, including research and CPD (continuing professional development) programmes.	The School will develop its commitment to continuing professional development within the Irish actuarial profession through support of the Modelling Institute of Actuaries subject, as well as securing an exemption recognition agreement with the Institute for the Graduate Certificate in Actuarial Science. It will also explore the possibility of holding the Modelling module for qualified actuaries, as well as the development of a part-time postgraduate programme covering the Specialist Technical subjects of the Institute. The School is also committed to holding the Actuarial Teachers and Researchers' conference within the next five years.

	Addressee	Priority	PRG Recommendation	Response
13	S	P3	The Faculties of DCU have undergone relatively recent changes in their membership, and it is recommended that the School develop and build on new links within the DCU science education communities and exploit its position in the Faculty of Science and Health.	The School will cultivate the existing channels of contact with the rest of the faculty through cross research (eg NCPST), service teaching, new joint degrees (such as the Maths stream on the BSc. in Science Education). The School will continue to lead the Faculty-wide programme of training of tutors.

Staffing Accommodation and Resources:

	Addressee	Priority	PRG Recommendation	Response
14	U	P1	It is recommended that the university (Budget Committee, Resource Review Group)/Teaching and Learning should fund the Mathematics Learning Centre as a university wide resource.	University Executive has already approved the commitment of resources to the Mathematics Learning Centre in recognition that the Centre is providing a valuable university – wide resource. Future resourcing of the centre will be subject to on-going review by the

	Addressee	Priority	PRG Recommendation	Response
				OVPLI, Budget Committee and Executive.
15	S	P1	It is recommended that the School increase the pool of existing staff able to teach certain Core Technical modules – in which context it should consider training for existing staff rather than recruiting new staff.	The School is widening the number of staff able to teach modules in Stochastic Processes and Financial Economics which are required for Institute of Actuaries Core Technical subjects. However, not all such subjects are suitable to be taught by staff without actuarial experience, such as Life Contingencies and Actuarial Models. Similarly, non-mathematical subjects such as Accounting and Economics will continue to be delivered to the School's programmes by DCU Business School.
16	U	P2	It is recommended that the School continue to bring to the attention of the University the fact that the budgeting mechanism used by the University is at present inequitable. Provision of incentives is necessary.	The budget SCR mechanism, currently in use in DCU, was agreed by all head a number of years ago. As Heads of Schools are aware with the institution of Executive Faculties, allocation of school budgets now rests with the Deans of Faculty. However university management have noted the concerns expressed regarding school budget, by the Head of the School of Mathematical Sciences. It is also the case, as indicated above, that the university budget model is currently under review.
17	S	P2	It is recommended that the School liaise internally to ensure that suitable computer facilities are available to students at the commencement of the next academic year.	The School will press for the implementation of the University policy on wireless networks. In the mean time, we will cultivate our good relations with the School of Computer Applications to guarantee access to their

	Addressee	Priority	PRG Recommendation	Response
				laboratories for our students. A linked question is the availability of suitable software. Computing Services have announced that the Mathematica licence, which runs out in January 2007 will not be renewed. The School will endeavour to obtain funding for a replacement licence.
18	S	P3	It is recommended that the School exploit university resources such as the Public Relations and Marketing office to make Mathematics degrees more attractive to second level students in an effort to reduce falling student numbers.	<p>The group within the School appointed to oversee a thorough revision of the MS degree has made attempts to obtain information from these sources to inform this revision. The group has invited Deirdre Wynter of the Public Affairs and Media Relations Office to share research results from students' focus groups and incoming students.</p> <p>The School has engaged in the usual University marketing activities that have taken place so far this academic year (Higher Options, Postgraduate Fair, Open Day).</p>

3. PRIORITISED RESOURCE REQUIREMENTS

1. Marketing and advertising of new undergraduate degree, including professional advice on mounting a successful communication campaign and on producing effective promotional material. Estimated cost €30,000 (incurred in 2007).
2. Purchase of Mathematica licence. Estimated cost €12,000 (incurred in 2007).
3. Marketing abroad, and in particular in the Far East, the planned conversion course in actuarial mathematics. Estimated cost €25,000 (incurred in 2008-2009).

4. SUMMARY OF THE ONE-YEAR PLAN

REVAMP OF DEGREE

The entire teaching portfolio of the School will have to be revamped, with a view to addressing both the number and the quality of entrants. The School sees this as its first priority, and a determined effort in this direction is already under way. The new degrees should be approved by Academic Council within a year, with recruitment starting from September 2008.

ACCOMMODATION: SHORT TERM

The School faces an immediate accommodation crisis in that it finds itself under pressure to vacate at short notice the premises that it occupies currently. The cooperation of the Faculty and University authorities will have to be secured in order to minimise any resulting disturbance and optimise our space allocation.

MATHS LEARNING CENTRE

The School will pursue at both Faculty and University level the permanent establishment of the Maths Learning Centre, with a view to having a permanent Director in place by the end of the current Manager's contract.

ACTUARIAL EXEMPTIONS FOR GCAS

The School will apply to the Institute of Actuaries for an exemption recognition agreement for the Core Applications subjects taught on the Graduate Certificate in Actuarial Science (GCAS). This will be done with a view to ensure that students, including the 2006/7 GCAS intake, can be recommended for exemptions from Subjects CA1-CA3.

SECRETARY'S CAREER STRUCTURE

Our secretary plays a crucial role in the smooth operation of the School. It is the unanimous view of staff members that it would be a waste of expertise if her legitimate career expectations were not to be met within the School. Accordingly, the Head of School will make the strongest case possible for her promotion to grade three within a year.

RATIONALISATION OF TEACHING

A certain amount of redundancies and duplications exist in the School's service teaching activities. In the past, the School has tended to offer tailor-made modules where minor variations on existing syllabi would have sufficed. There is no reason why the majority of these inefficiencies cannot be eliminated while maintaining the good relations that exist currently with our client schools. This programme of rationalisation has been initiated and should be completed by March 2007.

STAFFING: ONE-YEAR HORIZON

The immediate need of the School lies in the actuarial field. Currently, we employ part-time actuaries to teach on the Graduate Certificate in Actuarial Science. The funds for paying these highly skilled professionals were guaranteed to us for the first three years of the degree; this initial period runs out at the end of 2007. Accordingly, we will seek to obtain sanction for a second permanent actuary, in line with the increased recruitment on GCAS.

LIAISON OFFICER

The School will revisit the position of a Schools Liaison Officer. A proposal will be brought to the School regarding the exact nature of this position, with clearly defined roles and responsibilities and appropriate teaching allowance.

RESEARCH INITIATIVES

The strategic plan for research will be developed.

Research student recruitment initiatives will have been instigated as follows:

- "Research days" at which undergraduate students will attend talks on research opportunities in the School
- Posters circulated to all maths and physics departments on the island of Ireland, as well as to selected departments throughout the EU and internationally with which we have contact.
- Avail of all opportunities to contact undergraduates of other Universities in Ireland directly (through presentations etc).

Grant application collaboration: Members of the School will begin to collaborate with each other to improve the research grant applications being submitted by the School.

The School's webpages will be fully updated to reflect the core nature of research within the School.

ACCREDITATION

The School will submit the appropriate material to ensure that its relevant degrees are recognised by the Teacher Registration Council of the Department of Education and Science as providing approved subject qualifications for secondary school mathematics teachers.

5. SUMMARY OF THE THREE-YEAR PLAN

MARKETING OF NEW DEGREES

The School will need to market and advertise vigorously its new degrees. It is envisaged to retain the services of experts in the field of communication in order to maximise the impact of the redesigned programmes.

REVAMP OF MASTER'S PROGRAMME

The Master's programme in Financial and Industrial Mathematics will be redesigned to retain its compatibility with the relevant undergraduate programme. Consideration will also be given to a shorter (Graduate Certificate) course; this would not include the major project which is an essential feature of the MSc. Access to the MSc. would be conditional on a minimum achievement standard in the first semester examinations.

STAFFING: MEDIUM TERM

The staffing of the School is currently at the same level as in 1997 (see Appendix 2 of the Self Assessment Report). The ambitious development programme outlined above will have to be accompanied by staff recruitment on a scale commensurate with our increased contribution to the Faculty and the University. In this regard, the School takes comfort from the President's statement, reported by the Peer Review Group (see p. 12 of their report) to the effect that "budgetary constraints will not impede concrete development proposals for Mathematical Sciences".

ACCOMMODATION: MEDIUM TERM

Our current premises barely meet the School's needs in its present configuration. Any expansion will require an improved space allocation. The School will continue to liaise with the Facilities Manager of the Faculty in order to secure its fair share of the overall space envelope.

BUDGET

The current budget allocation process discriminates unfairly against the School; this statement, which is supported by a detailed argument in section 6.1.6 and appendix B of the self-assessment report, has been accepted by the Peer Review Group. The School will seek the assistance of the Faculty authorities in securing its fair share of resources in any revised budgetary process.

INTERNAL SABBATICALS

The School will strive to implement a system of half-yearly internal sabbatical leave, subject to adequate staffing.

EXTENSION OF GCAS

In consultation with the local profession, the School will explore the possibility of expanding the scope of the Graduate Certificate in Actuarial Science to cover nationally relevant subjects from the Institute of Actuaries series of Specialist Technical subjects. This would be done with a view to obtaining an exemption recognition agreement for these subjects from the Institute. This development is subject to appropriate staff resources .

NATIONAL CENTRES

The School will continue to be one of the recognised drivers of large-scale national endeavours such as graduate schools and national centres of excellence in astrophysics, mathematical finance, mathematics teaching and learning, and applied mathematics.

CONVERSION COURSE

The School will develop a Diploma--level degree programme for students who have already obtained an undergraduate degree in a quantitative discipline, and who wish to train to become actuaries. Such a programme would cover the Core Technical subjects of the Institute of Actuaries. It would aim be attractive not only to local students wishing to change career, but also to overseas students wishing to become actuaries.

APPENDIX ONE

- **School Quality Committee (for the Self-Assessment Report)**

Ms. Karen O'Shea, School Secretary.
Dr. Niamh O'Sullivan, Lecturer.
Prof. Emmanuel Buffet, coordinator of Master's programme.
Prof. John Carroll, Head of School (Sept 2005-Aug 2006).
Mr. Noel Fitzpatrick, PhD student.

- **Peer Review Group**

Prof. Martin Newell, NUI Galway (chair)
Prof. Christopher Baker, The University of Manchester and the University of Chester.
Ms. Aisling Kennedy, Director of Professional Affairs, The Society of Actuaries in Ireland.
Dr. Gerard McNamara, Head of School of Education Studies, DCU.
Ms. Ursula Baxter, Senior Faculty Administrator, DCUBS. (rapporteur)

- **School Quality Committee (for the Quality Improvement Plan)**

Dr. John Appleby, Coordinator of FM and GCAS degrees.
Prof. Emmanuel Buffet, Head of School (from September 2006).
Dr. Turlough Downes, Research Convenor.
Dr. Brien Nolan, Coordinator of Service Teaching.