

Quality Implementation Plan for the Department of Chemistry

1. Recommendations which the Department could implement unaided

Recommendation 1.1: *There is a need to better organize and formalize a mentoring program for new academic staff.*

Response of Department: *The system presently in operation will be reviewed in 2011. Two new staff members will be commencing employment in January 2011. This is seen as an ideal time to revise the current system based on the experience and recommendations of both employees.*

Action: *Following review and consultation with the new staff members it has been decided that the appointment of an appropriately experienced and dedicated mentor (for each new staff member) is the most practical and efficient solution.*

Recommendation 1.2: *There is a need to revise the tutorials that are now given and to make a chemistry tutorial resource.*

Response of Department: *The system presently in operation in 2nd – 4th year will be reviewed in the Academic Year 2010-11. 1st year tutorials have been reviewed and there has been a successful transition to an on-line web-based tutorial system which is linked to the recommended 1st year text book. A similar system will be considered for 2nd – 4th year.*

Action: *The review of all modules and laboratory experiments was completed in 2011 (see Recommendation 1.8). The tutorial review will be completed in 2012.*

Recommendation 1.3: *One person should be allocated the task of financial accounting as her/his sole responsibility.*

Response of Department: *This recommendation has now been implemented. The overall responsibility for financial accounting lies with the Head of Department, but the daily implementation of policy has been delegated to the Chief Technical Officer, who already carries out the majority of ordering. Support for appropriate training will be provided when such training is available as per consultation with the Staff Development Office.*

Action: *No action required.*

Recommendation 1.4: *It was not clear that the postgraduate students had any centrally organized advanced course work or transferable skills training. This could be a problem as this training load currently falls on individual supervisors.*

Response of Department: *The new Structured PhD Programme in Chemistry will be introduced in the academic year 2010-11. The programme contains a variety of modules covering advanced course work and transferable skills training which all PhD students will be required to take.*

Action: *Implemented - no action required.*

Recommendation 1.5: *We were told there is no “due process” if someone has a problem with a student or a supervisor. While the current Head is very approachable, there should be a formal process if someone has a problem with a supervisor.*

Response of Department: *This is now addressed in the Structured PhD Programme in Chemistry where a Supervisory Committee oversees student progress as part of a formal review process.*

Action: *No action required.*

Recommendation 1.6: *Contact between students and supervisors is not as frequent as desired by the students as the supervisors are all extremely busy with other tasks in the Department. This was particularly reflected in delays in revising manuscripts for publication.*

Response of Department: *The Structured PhD Programme in Chemistry requires formal planning and meetings between supervisors and postgraduate students. While this will help address this concern to some extent low staff numbers and heavy workloads (see Recommendation 3.1) mean that it is very difficult to find a satisfactory solution.*

Action: *No action required.*

Recommendation 1.7: *The postgraduate students and postdoctoral researchers commented that they would like to see more funds available to go to conferences.*

Response of Department: *A Departmental Conference Fund has been established to enable two postgraduate students to attend a national/international conference each year. This fund will be managed by the Department's Postgraduate Committee.*

Action: *Implemented - no action required.*

Recommendation 1.8:

- *Some of the undergraduate students commented that they would like to have more choice of modules in the 3rd year. General chemistry students have the least choice and they cannot do the Pharmaceutical Chemistry modules if they would like.*
- *The laboratories do not apparently follow the lecture materials in some classes such as Organic Chemistry.*
- *The undergraduate students commented that they would like the teaching to be more relevant to life sciences and industry.*

Response of Department: *We feel that such comments are a direct consequence of the initial rush to introduce modularisation in 2004. In order to address these and other issues related to undergraduate teaching the Department plans to carry out a significant review of all undergraduate laboratory practical sessions and their*

associated modules so that the chemistry curriculum is truly modular and open to provide more student choice. This review will include an examination of Marks and Standards to ensure students achieve appropriate levels in both the written and continuous assessment components of their courses. A Review Committee has been established for each year which includes appropriate academic and technical staff. Each Committee has a Secretary who will convene the meetings and all Committees will be chaired by the Head of Department.

In addition, we will pursue accreditation of our undergraduate degrees with both the Royal Society of Chemistry (UK) and the Institute of Chemistry of Ireland, and will investigate the possibility of a joint taught MSc. (e.g. in Chemical Biology) with the Department of Biology. In conclusion, we look forward to working with the University in improving the quality experience that is chemistry at NUIM.

Action: Implemented - no action required.

Recommendation 1.9: *No clocks or periodic tables on the walls in the laboratories.*

Response of Department: Cloaks and periodic tables will be placed in all teaching laboratories.

Action: Implemented - no action required.

Recommendation 1.10: *The Undergraduate students commented that they were surprised that only their final year marks determined their degree class. This seems strange for a degree such as the chemistry with pharmaceutical sciences honours degree, as the final year is dominated by the pharmaceutical science material.*

Response of Department: Currently we apply the normal Marks and Standards rule whereby the third year marks benefit (30% contribution) a student if their 4th year marks are lower than those obtained in their penultimate year. Commencing in the academic year 2010-11 the Pharmaceutical and Biomedical Chemistry denominated degree will automatically include the 30% contribution from the third year results. The reason for this change is that 30 credits of the 4th year marks are derived from two continuous assessment/practical modules – the six month Work Placement (CH414) and Advanced Labs (CH415). The remaining 30 credits are made up of six 5 credit modules taken in the second semester when the students return from their Placement. Making it mandatory that a component of the third year marks are included in the final year marks ensures that the students are assessed on their broad understanding of the subject and limits any bias associated with good performance in continuous assessment in 4th year. It would not be appropriate to make this change for the Omnibus Science degree(s) and the current University Marks and Standards rule will remain in effect.

Action: No action required.

Recommendation 1.11: *The staff [technical] dislike having to go to the “solvent shed” to decant solvents from large drums. Most would like to see the Department purchase smaller bottles instead of drums.*

Response of Department: *This will be reviewed during the 2010-11 academic year by the Departmental Safety Committee in consultation with the Health & Safety Office.*

Action: *No action required – In 2011 the Department switched from bulk purchasing of its solvents in 205 L drums to purchasing pure solvents in 2.5 L glass Winchesters.*

Recommendation 1.12: *The technicians feel they should be consulted more before major purchases are made. They occasionally feel left in the dark and think they could help more here. They also feel they are not consulted before new equipment is purchased and then that those in charge assume they will be ready to set it up and run it. It appears a little ownership in these decisions needs to be passed to the staff.*

Response of Department: *This will be reviewed in consultation with both technical and academic staff. The management of core technologies (e.g. NMR, SEM, Mass Spectrometer, etc.) is now assigned by the Head of Department to appropriate academic and technical staff. Where possible, appropriate training is supported financially by the Department and the University. Examples of recent and forthcoming training includes attendance by academic and technical staff on external professional courses in Mass Spectrometry, SEM and NMR techniques.*

Action: *Implemented - no action required.*

2. Recommendations which the Department could implement only with assistance from other bodies within the University and without cost implications

Recommendation 2.1:

- *The undergraduate students commented that printing documents and assignments was difficult at the library and they would like to have easier access to a printer.*
- *The undergraduate students commented there was not enough private study space in the Department. Things are very crowded.*

Response of Department: *It is difficult to address these issues at a Departmental level given the space limitations within the Department (see Recommendation 3.2).*

Action: *The resource implications will be considered by the Senior Officers, possibly in light of a space audit. It was noted that the new Library will significantly address these issues.*

Recommendation 2.2: *The staff undertaking administrative roles within the Department are unsustainably overloaded with tasks. They constantly are forced to switch time between budgeting, examinations, student problems and other tasks that are typically ‘must do now’ to the detriment of their job satisfaction for their primary job. This situation is not at all robust in the event of an unforeseen crisis.*

Response of Department: *The appointment of a new half-time administrative assistant will help alleviate this problem (see Recommendation 3.1). In addition, time management and training issues for administrative staff will be reviewed in consultation with the Staff Development Office.*

Action: *The half-time administrative assistant is now full-time and this has significantly addressed the issues raised.*

3. Recommendations which the Department could implement only if additional resources are provided by the University

Recommendation 3.1: *The Department of Chemistry is relatively small compared to other Departments of similar research and teaching quality and load. The university should aim to double the size of the academic staff over the next 5 or perhaps 10 years. If chemistry is going to be useful to the initiative of growing interaction between biology and chemistry, it cannot be a significantly smaller sibling to the Biology Department. The current situation in the Department is such that the support staff and administrative staff are overworked.*

Response of Department: *Such staffing issues are being addressed at a Departmental level through acquiring external funding (ca. €2.6 m to date) for new academic staff members. Examples here include grants from: SFI - Stokes Lectureship and PIYRA award (recipient details currently confidential); the EPA; and the HEA/Enterprise Ireland. At a University level the recent permanent appointment is a positive and welcome move.*

The Department’s plan will be to continue to seek external funding and resources where possible. However, it is vital that the University continue with its support in this area, for example, through the establishment of a tenure-track programme so that we don’t lose the young talent recently attracted to the University, and that it recognises the need to match such increases in academic staff with appropriate support staff. The immediate requirements with respect to the latter are at both technical and administrative levels: a recent appointment to the technical staff, will be out of contract in September 2011 – it is important that the appointee is considered for a permanent position. Extra support at an administrative (Executive Assistant) level is also required as in Recommendation 2.2.

Action: *An extra full-time administrative assistant was appointed to Chemistry in 2011 (one year contract). This contract, and that of the technical officer (one year contract), will be renewed in 2012.*

Recommendation 3.2: *New building space is desperately needed for research in the Department, even without expansion. This is more important with expansion,*

of course. We have never seen a good Department like this in such dire need of reasonable research space.

Response of Department: The Department has restructured itself internally to utilise all its current space to maximum effect. The increase in postgraduate numbers has meant that students currently have their desks in laboratories contravening Health and Safety regulations. Undergraduate laboratory sessions have increased, and in some situations are now being run in different laboratory locations at the same time. This places substantial pressure on both technical and demonstrating staff and can potentially compromise the quality of teaching of what is a practical subject. It is felt that a space audit, as suggested by the reviewers, would significantly address such issues.

Action: This is to be discussed by the Senior Officers.

Recommendation 3.3: *It is difficult to maintain research programs in synthetic and pharmaceutical chemistry without access to high field NMR.*

Response of Department: The current NMR is now 12 years old and barely supported by the manufacturer (Bruker). It is universally recognised that data from this machine will soon no longer be accepted for publication in scientific journals. A modern chemistry Department cannot exist without an appropriate NMR, and advanced research programmes, such as that proposed by the Department's successful SFI PIYRA applicant, require this level of instrumentation. Cost ca. €700,000.

Action: The University/Senior Officers will support applications to SFI/Wellcome or other external funders.

Recommendation 3.4: *Equipment - access to a modern electron microscope is absent, there is only one HPLC for the postgraduate students, and the FTIR is quite old.*

Response of Department: The current electron microscope was a gift from Hewlett Packard Ireland. While it is over 10 years old the Department has recently invested €40,000 upgrading this instrument. The Department considers this a University resource and core facility. A second HPLC system and new research FTIR would significantly enhance the research capacity of the Department in the area of synthetic chemistry. Cost ca. €30,000 (HPLC) and €40,000 (FTIR).

Action: The University will support applications to funding agencies and the Senior Officers will review the need for a strategic equipment replacement plan, and an overhead policy to support it. Note: A new overhead policy has recently been introduced by the VP for Research.

Recommendation 3.5: *Hire an Executive Officer to support the Department Head and develop a strategy for long-term stability in the Department leadership. This plan should include speedy promotion of at least one of the senior academic*

staff and a plan to get these staff involved in the Department leadership. The Executive Officer will coordinate interactions, oversee the nonacademic staff, oversee budgets, and carry out day-to-day operations in the Department. They will also provide a consistent focal point for Departmental operations making it much easier for staff and students to make contact, address issues, and to rapidly make decisions.

Response of Department: An Executive Officer (as recommended by the Reviewers) will be required to deal with the increased administrative load associated with increased staff and postgraduate/undergraduate numbers.

Action: This will be considered by Senior Officers. The allocation of a second full-time administrative assistant (see Recommendation 3.1) has helped with respect to addressing this recommendation.

Recommendation 3.6: *Build a connecting building “bridging” between Chemistry and the Life Sciences to house core facilities and institute research groups. This should include student accommodation and some fluid research lab space. Linking chemistry and biology is the key to the future of both of these Departments. These seem to be the core strengths of science at Maynooth and these are the Departments that will play the largest role in the expansion of science research to meet the needs of the 21st century. We feel the chances of obtaining a major grant to build a new building will be most sellable with such a plan, especially if this building is connecting the Departments. This is certainly superior to expanding any building that is only a small part of the overall picture in science. As part of this assessment, we were told that buildings are currently organized in ways that do not promote interactions where they could be strongest. Engineering shares space with immunology, computer science with biology, chemistry with math and physics, psychology with geography, and the Hamilton Center with student residences. We recommend a space audit across all of science and development of a plan that will promote interactions where they have the best possibility of success.*

Make the connecting building a foyer for the university and access foyer for the Departments. We think that a new building connecting biology and chemistry would make a great showcase for science in the university. Such a building could be built with a foyer that would be a real asset; it is in an ideal place on campus for such a foyer.

Response of Department: These issues should be considered at a strategic level by the University Senior Management team as it is outside of the control of the Department.

Action: This will be considered by Senior Officers.

Recommendation 3.7: *To really meet the needs of the university, address the central position of chemistry in issues facing society, and take advantage of the momentum currently present in the Chemistry Department, we recommend that the Department increase the size of the faculty to twice its current size over the next five to ten years. The current growth in responsibility and productivity of the Department is clearly not sustainable without this kind of increase in the*

academic staff. This will also enable it to maintain some pace with biology, which is extremely important if they are to interact with success as equals. We feel one of the hires should be a senior person that can bring some added leadership, vision, and visibility to the Department. We feel it is also reasonable to set a goal to double the number of graduate students in the Department, and the Department is already on pace to increase the number of undergraduate majors by 50%. Finally, the other departmental staff will need to be increased in parallel and a plan for this growth should be developed.

Response of Department: These issues should be considered at a strategic level by the University Senior Management team as it is outside of the control of the Department.

Action: This will be considered by Senior Officers.

Recommendation 3.8: *The Department should work with the Department of Biology to obtain some new and needed equipment (NMR, FTIR, more HPLCs, etc.)*

Response of Department: The establishment of the new Institute of Biological Chemistry will ensure closer interactions between both Departments. It is anticipated that this will facilitate sharing of resources and strategic planning in terms of purchasing new items of equipment. A good example of this is the recent co-purchase of Mass Spectrometry equipment.

Action: This will be considered by Senior Officers (see also above re strategic equipment replacement plan - Recommendation 3.4)

Professor Philip Nolan
21st March 2012

Professor John Lowry
March 2012

Appendix: General Departmental response to the Peer Review Report (optional)

The Quality Review Report was distributed to all members of the Department in November 2009. It was subsequently raised at intervening staff meetings. In addition, the Department Head held meetings with different staff groupings in the first quarter of 2010 in order to elicit their views and reflections on the document. The overall view is that this is a positive document which accurately reflects the current status of the Department. It fairly acknowledges the strengths and weaknesses and offers very useful advice on both large and small issues that need to be addressed by both the University and the Department.

Probably the biggest identified threat to the Department is sustainability. As acknowledged in the Report *staff and faculty are in many cases willing to work extremely long hours, far beyond what is typical and what is sustainable*. There is no doubt that the current momentum in terms of development and growth is unsustainable without further support from the University. While we acknowledge that the current economic environment makes this a challenging objective we feel that key decisions, particularly related to internal resources, can be made by the University's senior management which will help to significantly address the important/critical issues highlighted in the Report.

Note: The staff of the Department of Chemistry would like to take this opportunity to thank the staff of the Quality Promotion Office for all their advice and support during the Quality Review process. We would also like to thank the Quality Promotion Sub-Committee (QPSC) members and Internal Reviewers for their time, patience and support. Finally, we would like to acknowledge the courtesy and professionalism of the External Reviewers during their visit to the Department.