Faculty of Life Sciences

Summary of the Periodic Review of degree programmes in Chemistry

Programmes covered by the Periodic Review

1. The programmes covered by the Periodic Review were:

   - BSc Chemistry
   - BSc Chemistry with a Year in Industry
   - BSc Chemistry with Forensic Analysis
   - BSc Chemistry with Archaeology
   - BSc Chemistry with Education
   - BSc Chemistry (via the Open University 2+2 route)
   - MChem Chemistry
   - MChem Chemistry with a Year in Industry
   - MChem Chemistry with a Year in Europe
   - MChem Chemistry with Medicinal Chemistry
   - MSc Chemical Research

Date of the Periodic Review


Objectives of the Periodic Review

3. The objectives of the Periodic Review were to:

   - Review the effectiveness of the means by which the Department of Chemistry manages and assures the academic standards of the degree programmes under Review, and the quality of the learning opportunities provided;
   - Enable the Department of Chemistry to consider how it might enhance its portfolio of taught programmes and the learning experience of its students, and to consider the effectiveness of its approach;
   - Consider the future plans of the Department of Chemistry for its taught programmes;
   - Enable an independent Panel to review this self-evaluation through consideration of documentation and discussions with staff and students;
   - Provide a means by which the Department of Chemistry was able to reflect on the success, enhancement and future development of the taught programmes that it offered;
   - Identify examples of good and effective practice;
   - Consider whether the programmes under Review should continue to run for a further or initial period of up to six years, as appropriate.
Conduct of the Periodic Review

4. The Periodic Review was conducted by a Panel chaired by the Director of Teaching and Learning for the Faculty of Arts and Humanities, with two internal members of academic staff (from the School of Biological Sciences and the School of Mathematics, Meteorology and Physics), and two external members of academic staff (from Loughborough University and the University of Southampton). The Sub-Dean acted as Secretary to the Review Panel.

The Panel received a range of documentation in advance of the Review, including a Self-Evaluation Document prepared by the Department of Chemistry, a copy of the *Pathfinder* report, relevant programme specifications, programme handbooks, and External Examiners’ reports. During the Review visit, the Panel considered further documentation, and met with a number of staff from the Department and from the University Library. In addition, the Panel met with a number of current students in Chemistry, graduates of the Department, and employers from the chemical and pharmaceutical industries and from education. The Panel undertook a tour of facilities in the Department, including teaching laboratories and the Chemical Analysis Facility.

Evidence base

5. The Panel considered a wide range of evidence, including programme specifications, module descriptions, programme handbooks, External Examiners’ reports and the Department’s responses, minutes of relevant committee meetings (including the Departmental staff – Student Committee and Boards of Studies meetings), Annual Programme Reports and statistical data.

The Panel received feedback from staff and students in the Department, along with feedback from employers and former students.

External peer contributors to process

6. The external members of the Review Panel were appointed by the Joint Faculty Board for Teaching and Learning in Science and Life Sciences, after the consideration of nominations from the Department of Chemistry. The role of these external members was to provide subject expertise and to provide an expert judgement of the validity and appropriateness of the programmes under Review.

The external members, as well as being subject experts, also had significant experience working with the accrediting body, the Royal Society of Chemistry (RSC).

Overview of the main characteristics of the programmes covered by the Review

7. The Department offers a suite of BSc and MChem programmes, which are accredited (MChem) or ‘recognised’ (BSc) by the Royal Society of Chemistry. Programmes are provided both in Chemistry, and in Chemistry combined with other subject areas / specialisms including Forensic Analysis, Archaeology, Education, and Medicinal Chemistry. A number of the degree programmes involve an industrial placement year.

The Department makes significant use of small group tutorials in its teaching, to complement lectures and practical classes. New technology (including Personal Response Systems (PRS)) is utilised in lectures, to provide immediate feedback to students.
Traditional teaching methods are complemented by new approaches, such as the Part 4 module CH4CR Current Topics in Chemical Research, whereby students attend a series of research colloquia given by external lecturers and produce a scientific report.

The Department monitors changes to the A-level Chemistry curriculum, and takes steps to adjust its Part 1 teaching accordingly. The Department has established a mentoring scheme, whereby students in the later years of their degree act as mentors to Part 1 students, and the Department provides additional support classes for students in Part 1 who need them. The Departmental Senior Teaching Technician contributes to the development of teaching and learning, and there is input from industry in terms of the Career Management Skills module and other taught provision.

Conclusions on innovation and good practice
8. The Panel identified a number of areas of innovation and good practice, including:

- Steps taken by the Department to monitor changes to the A-level Chemistry curriculum, and to revise Part 1 teaching accordingly;
- The use of student focus groups for module evaluation;
- The use of innovative technology in teaching and learning, such as Personal Response Systems and wiki sites on Blackboard;
- Significant outreach activity with local schools;
- Provision of additional support classes and introduction of a mentoring scheme for Part 1 students;
- Use of technical staff in contributing to teaching and learning;
- The intended use of the new Chemical Analysis Facility to support the student experience.

Conclusions on quality and standards
9. The Panel agreed that the degree programmes offered by the Department meet the stated aims and objectives, and are of appropriate standards and quality. The MChem programmes are accredited by the Royal Society of Chemistry, and the BSc programmes are recognised by them, and the learning outcomes of the programmes are being obtained by students. The programme specifications and other documentation are appropriate.

Conclusions on currency and validity of the programmes under Review
10. The aims and outcomes of the degree programmes run by the Department are appropriate, both in terms of the level and coverage of the discipline. Subject material, particularly at Parts 3 and 4, is informed by the research interests of academic staff within the Department. The Panel was reassured that other new areas at the frontiers of the discipline are considered for inclusion into the degree programmes, based on staff and industry input. The Panel agreed, however, that the Department should consider the balance of its provision at Parts 2, 3 and 4 with respect to inorganic chemistry, particularly in the light of recent staff changes.

Additional support classes are provided at Part 1 for students who need them, and the Department makes extensive use of small-group tutorials in its teaching – these are well liked by students. Many of the degree programmes offer students the opportunity to expand their skills through working in industry for a year or through placements with local schools. The Department makes use of innovative technology in its teaching, and engages actively with both University-wide and national initiatives. The new Chemical
Analysis Facility will provide exciting opportunities to enhance the student experience yet further.

Recommendations

11. The Panel recommends to the Joint Faculty Board for Teaching and Learning that, subject to the Department addressing the issues listed below, the following degree programmes be re-approved to run for a further six years:

   BSc Chemistry
   BSc Chemistry with a Year in Industry
   BSc Chemistry with Forensic Analysis
   BSc Chemistry with Archaeology
   BSc Chemistry with Education
   BSc Chemistry (via the Open University 2+2 route)

   MChem Chemistry
   MChem Chemistry with a Year in Industry
   MChem Chemistry with a Year in Europe
   MChem Chemistry with Medicinal Chemistry

   MSc Chemical Research

Issues to be addressed:

Advisable

1. The Department should consider formulating a policy on the number of contact hours which would normally be expected for a range of different types of module

Desirable

1. The Department should consider the balance of its provision at Parts 2, 3 and 4 with respect to inorganic chemistry, in the light of recent staff changes

2. The Department should continue to monitor ‘question spotting’ in examinations, and take further steps to reduce the problem

3. The Department should take further steps to ensure actions taken in response to student feedback are fully documented

4. The Department should take steps to ensure that opportunities for efficiency savings do not pass it by

5. The Department should continue its efforts to develop student learning towards independence

6. The Department should give further consideration to how to ensure the retention of knowledge by students across modules and Parts

7. The Department should consider increasing its BSc entry tariff, following analysis of relevant data

8. The Department should give further consideration to ways in which to improve student attendance and progression, particularly at Part 1, for instance through the wider use of short in-class summative assessments
9. The Department should give consideration to greater use of alumni contacts in the delivery of the Career Management Skills module

10. The Department should give consideration to formalising its existing links with industry