PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	BSc
4	**Programme Title**	Chemistry with Industrial Training
5	**UCAS/Programme Code**	F102
6	**Programme Accreditation**	
7	**QAA Subject Benchmark(s)**	Chemistry
8	**FHEQ Level**	Honours
9	**Date written/revised**	September 2008

10	**Programme Aims**
1	to enthuse students to chemistry by educating them with a thorough understanding of organic, inorganic and physical chemistry, including importance and sustainability of the chemical sciences in an industrial, academic, economic, environmental and social context.
2	to demonstrate how chemical principles can be applied to processes and systems
3	to provide training in problem solving, communication skills, numeracy and information technology
4.	to provide the opportunity for students to apply their skills in an industrial environment
5	to equip students with skills that enable them to pursue careers in chemistry, chemistry-related disciplines or other professions.
6	to develop students' practical skills including assessing risks so they can work in the laboratory safely

11	**Learning Outcomes**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the benchmark statements for chemistry.

Knowledge and Understanding

On completing the programme students should have a knowledge and understanding of

A1	The three main branches of chemistry (inorganic, physical and organic).
A2	Practical laboratory chemistry.
A3	Data analysis and numeracy.
A4	Spectroscopy and chemical characterisation.
A5	Some aspects of industrial chemistry.
A6	Develop an awareness of issues in chemistry related to other disciplines

Teaching and Learning Methods

Students acquire understanding and knowledge (the complexity of which increases as the course progresses) through lectures, tutorials and workshops (**A1**). At Stage 1, students learn basic, and at Stage 2 more sophisticated, technical procedures by performing carefully designed and tested experiments. In the lab classes and on placement they consolidate the learning started in lectures (**A1**, **A2**, **A4**) and improve on skill **A3**. At Stage 3 the students learn advanced practical methods and specialist theoretical material (**A1**- **A4**). On placement the students learn **A5**. Throughout the period of the degree the student is expected to read around the taught material to supplement and strengthen the taught/learnt work. Reading lists are provided to facilitate this. They develop **A6** in modules throughout the programme,

particularly related to biology, medicine and materials. Specialist aspects related to their placement are covered during their year in industry.

Assessment Strategy

Knowledge and understanding is assessed through unseen written examinations and in-course assessments (**A1**, **A3**, **A4, A6**), answers to questions in practical reports (**A2**) and oral examinations eg in the Stage 3 Advance Practical Chemistry module (**A2**), and the working in Industry (**A5**).

Intellectual Skills

On completing the programme students should be able to:

B1 Critically evaluate data including using computer software and models
B2 Apply learnt knowledge to unseen problems.
B3 Analyse and interpret data in terms of current underlying theory
B4 Independently plan and undertake a project.

Teaching and Learning Methods

Intellectual skills are developed by means of the teaching and learning programme outlined above. Students apply the concepts learnt in lectures to problems in laboratory work, seminars and tutorials. **B2** and **B3** are progressively developed and enable the students to solve challenging problems (Stage 1 in Data Handling, Stage 2 in Group Assignment and Stage 3 Problem Solving modules) which cross the boundaries of the chemistry modules studied earlier. Tutorials facilitate individual and group participation in answering problems. Students develop skills **B1** and **B4** during their placement and in their Stage 3 practical work

Assessment Strategy

Problem solving based examinations and oral responses to either problems or tasks (tutorials) are used to test skills **B1** - **B3**. Laboratory reports assess **B3**. Write up of independent Stage 3 practicals allows students to demonstrate, and be assessed in cognitive skills **B1** – **B4**

Practical Skills

On completing the programme students should be able to:

C1 Work safely and independently in a chemistry laboratory being able to conduct documented laboratory procedures including measurement of chemical properties.
C2 Plan and undertake an advanced practical course or non-laboratory based Communicating Chemistry project.
C3 Work on a project in an industrial environment

Teaching and Learning Methods

Students receive close supervision from postgraduate demonstrators and members of staff in the laboratory when performing experiments to enable them to develop safe working practices and good techniques. Formative feedback is used to enable progressive development of these skills (**C1**). At Stages 1 and 2 detailed experimental procedures are presented in laboratory manuals. On placement and in aspects of the Stage 3 Advanced Practical Chemistry module the students learn to plan and design the experiments for themselves (**C2, C3**), they work with a greater level of independence and perform more technically demanding procedures. Students taking Communicating Chemistry projects similarly develop skills in planning and running a project and they also learn to design a web page (**C2**).

Assessment Strategy

The skill **C1** is assessed by laboratory write-ups. At Stage 3 the student's practical competence is tested in the Advanced Practical module (**C1**). **C2** is assessed as part of the Stage 3 Advanced Practical Chemistry module or Communicating Chemistry project, and **C3** is not assessed.

Transferable/Key Skills

On completing the programme students should be able to:

D1	Communicate and express clearly ideas both orally and in writing
D2	Work in a group environment
D3	Manage time and complete work to deadlines
D4	Assess and form an opinion of other people's work including numeracy and mathematical skills.
D5	Find information from a range of sources
D6	Be self-reliant
D7	Critically evaluate data to solve chemical problems

Teaching and Learning Methods

The laboratory courses require the students to produce regular written work which is submitted to deadlines (**D1**, **D3**). Marked work is discussed with the students to develop their understanding as well as their powers of expression. A key skills module, 'Group Assignment' specifically addresses learning from, and working as part of, a group (**D2**). This module also includes information retrieval from a variety of sources and its evaluation, communication and presentation skills, assignments and reports (**D1, D3, D5**). Peer assessment is introduced in a practical course (Stage 2 Organic) and the Group Assignment (**D4**). Students develop skills **D1-3**, **5**, **6** when on placement, and further develop skills **D1, D3 – D6** and practise skill **D7** during the Stage 3 Advanced Practical Chemistry module. Solving challenging unseen problems at Stage 3 also develops skill **D7**. In some modules (Medicinal Plants and Chemical Biology) students have to summarize their understanding of aspects of the literature in the form of a poster.

Assessment Strategy

Written work and oral examinations are used to assess skill **D1**. Many of the skills are assessed in written examinations by both the answers and the approach to question answering. Key skills **D1, D2, D5** are addressed in the 'Group Assignment' module by peer assessment of individual contributions to the group effort and of a group presentation. The Stage 3 Advanced Practical Chemistry module evaluates skills **D1** - **D7**.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

The degree programme is offered full-time (4 years). Students have to take 120 credits at each stage for a total of 360 credits, except the year in Industry. All students take the compulsory modules outlined in each year. A number of option modules are open for each year of study and are chosen by the student in consultation with their personal tutor.

Key features of the programme (including what makes the programme distinctive)

The special feature of this programme is that the students spend a year working in the chemical industry between Stages 2 and 3. The year in industry is not assessed. The large number of option modules at Stage 1 allows students to take subjects that they have not studied before or further study subjects of interest. Selection of certain modules would also allow a student to transfer to, for example, the Chemistry with Medicinal Chemistry programme at the end of Stage 1. Students may transfer into the MChem programme at the start of Stage 3. A further feature is the choice of either an Advanced Practical Chemistry module or a 'Communicating Chemistry' project at Stage 3.

Programme regulations (link to on-line version)

http://www.ncl.ac.uk/regulations/programme/

13 Criteria for admission

Entry Qualifications
The standard offer for this programme is BBC including A Level Chemistry at grade B and preferably Mathematics or another science subject. GCSE Mathematics grade B required if not offered at a higher level.

AABB at Higher Grade including Chemistry at grade A and preferably Mathematics or another science subject is asked for from applicants with Scottish qualifications.

Applicants taking the International Baccalaureate are usually asked for 30 points with Higher Level Chemistry at grade 6 or above.

Admissions Policy/Selection Tools
Upon receipt of a UCAS application form offers of places are made to suitably qualified candidates. UK - based applicants are invited to visit Chemistry on an Open Day. During the day they will have a tour of Chemistry and the City. They also attend an informal interview with a member of academic staff. Applicants not based in the UK are not required to attend for interview.

Non-standard Entry Requirements
Applicants who hold non-standard qualifications will be considered on an individual basis.

Additional Requirements
Non applicable

Level of English Language Capability
Applicants for whom English is not their first language must provide evidence of a satisfactory command of English by means of an IELTS score of 6.5 or greater.

14 Support for Student Learning

Induction
During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/ tutorials/etc. The International Office offers an additional induction programme for overseas students (see http://www.ncl.ac.uk/undergraduate/international/

There is an Induction Week Programme in Chemistry which includes social events as well as informative presentations about the course, facilities and student support. Each student receives a Welcome Pack, including books, laboratory coat, safety glasses, Periodic Table, Calculator etc. Returning students also have induction week programmes

Study Skills Support
Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Academic Support
The initial point of contact for a student is with a lecturer or module leader, or their tutor (see below) for more generic issues. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Staff-Student Committee, and/or at the Board of Studies.

Pastoral Support
All students are assigned a personal tutor whose responsibility is to monitor the academic performance and overall well-being of their tutees. Details of the personal tutor system can be found at http://www.ncl.ac.uk/undergraduate/support/tutor.htm

In addition the University offers a range of support services, including the Student Advice Centre, the Counselling and Wellbeing team, the Mature Student Support Officer, and a Childcare Support Officer, see http://www.ncl.ac.uk/wellbeing-service/

Support for Students with Disabilities
The University's Disability Support Service provides help and advice for disabled students at

the University - and those thinking of coming to Newcastle. It provides individuals with advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies. For further details seehttp://www.ncl.ac.uk/disability-support/

Learning Resources
The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide computing facilities, see http://www.ncl.ac.uk/library
andhttp://www.ncl.ac.uk/iss/

All new students whose first language is not English are required to take an English Language Assessment in the Language Centre. Where appropriate, in-sessional language training can be provided. The Language Centre houses a range of resources for learning other languages which may be particularly appropriate for those interested in an Erasmus exchange. See http://www.ncl.ac.uk/langcen/index.htm

15 Methods for evaluating and improving the quality and standards of teaching and learning

Module Reviews
All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the School Teaching and Learning Committee and at the Board of Studies. Student opinion is sought at the Staff-Student Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Teaching and Learning Committee.

Programme Reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Teaching and Learning Committee.

External Examiner Reports
External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Teaching and Learning Committee. External Examiner reports are shared with institutional student representatives, through the Staff-Student Committee.

Student Evaluations
All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Staff-Student Committee, and the Board of Studies. The National Student Survey is sent out every year to final-year undergraduate students, and consists of a set of questions seeking the students' views on the quality of the learning and teaching in their HEIs. Further information is at www.thestudentsurvey.com/
With reference to the outcomes of the NSS and institutional student satisfaction surveys actions are taken at all appropriate levels by the institution.

Mechanisms for Gaining Student Feedback
Feedback is channelled via the Staff-Student Committee and the Board of Studies.

Faculty and University Review Mechanisms
The programme is subject to the University's Internal Subject Review process, see http://www.ncl.ac.uk/aqss/qsh/internal_subject_review/index.php

Internal Review Reports
This programme was covered by the Internal Subject Review of Chemistry held on February 2003 and was subsequently approved by Faculty Teaching and Learning Committee and University Teaching and Learning Committee. The team was impressed by the very positive relationships between staff and students – it was abundantly clear that the subject group are very student-focused and this was to their significant credit.

Previous QAA Reports
This programme received a QAA Developmental Engagement in April 2004. The Team reported that: "The DE team has confidence in the academic standards set and achieved for all programmes in the developmental engagement in chemistry at the University of Newcastle upon Tyne"; and "The DE team has confidence in the quality of learning opportunities that support students in achieving the academic standards of the awards for all programmes in the developmental engagement in chemistry at the University of Newcastle upon Tyne.

Accreditation reports
Not applicable

Additional Mechanisms
N/A

16 Regulation of assessment

Pass Mark
The pass mark is 40 (Undergraduate programmes)

Course Requirements
Progression is subject to the University's Undergraduate Progress Regulations (http://www.ncl.ac.uk/regulations/docs/) and Undergraduate Examination Conventions (http://www.ncl.ac.uk/regulations/docs/documents/UGExamConv0809.pdf). In summary, students must pass, or be deemed to have passed, 120 credits at each Stage. Limited compensation up to 40 credits and down to a mark of 35 is possible at each Stage and there are resit opportunities, with certain restrictions.

Weighting of Stages
Modules taken at Stages 2 and 3 are Honours modules and the two stages contribute to the award of the final degree in the ratio *<2:1>*

Common Marking Scheme
The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions, namely

	Honours	**Non-honours**
<40	Fail	Failing
40-49	Third Class	Basic
50-59	Second Class, Second Division	Good
60-69	Second Class, First Division	Very Good
70+	First Class	Excellent

Role of the External Examiner
An External Examiner, a distinguished member of the subject community, is appointed by Faculty Teaching and Learning Committee, after recommendation from the Board of Studies. The External Examiner is expected to:

- See and approve examination papers
- Moderate examination and coursework marking
- Attend the Board of Examiners
- Report to the University on the standards of the programme

In addition, information relating to the programme is provided in:

The University Prospectus (see http://www.ncl.ac.uk/undergraduate/)
The School Brochure (contact http://www.ncl.ac.uk/forms/enquiries/)
The University Regulations (see http://www.ncl.ac.uk/regulations/docs/)
The Degree Programme Handbook (see http://www.ncl.ac.uk/chemistry/teaching/chemistry_handbook/0809/index.htm

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

Annex 1

Mapping of Intended Learning Outcomes onto Curriculum/Modules

Development of specific Intended Learning Outcomes occurs through the following modules (compulsory modules in bold text, optional modules in normal, italic text)

A1.	Inorganic, Organic, Physical Chemistry	**CHY1101, CHY1201, CHY1202, CHY1301, CHY1401, CHY2001**, *CHY2002*, **CHY2003**, **CHY2101,** *CHY2102*, **CHY2201, CHY2301, CHY2401,** *CHY3001, CHY3002***, CHY3101, CHY3201, CHY3301**, **CHY3401, CHY3402**
A2.	Practical laboratory chemistry	**CHY1101, CHY1102, CHY1201, CHY1301, CHY2101, CHY2201, CHY2301, CHY2401,** *CHY3001*
A3.	Data analysis and numeracy	**CHY1101, CHY1201, CHY1202**, **CHY1301, CHY1401**, **CHY2003, CHY2101,** *CHY2102*, **CHY2201, CHY2301, CHY2401,** *CHY3001*, **CHY3101, CHY3201, CHY3301**, **CHY3402**
A4.	Spectroscopy and chemical characterisation	**CHY1201, CHY1202**, **CHY1301, CHY2001**, **CHY2003**, **CHY2101, CHY2201, CHY2301, CHY2401,** *CHY3001*, **CHY3201, CHY3301**, **CHY3401, CHY3402**
A5.	Some aspects of industrial chemistry	**Placement in Industry**
A6.	Awareness of related disciplines	**CHY1101, CHY1201, CHY1301, CHY1102, CHY2201, CHY2101, CHY2301, CHY2003, CHY2102, CHY2002, CHY3101, CHY3201, CHY3301, CHY3401, CHY3402**
B1.	Critically evaluate data	*CHY3001, CHY3002***, CHY3201, CHY3401, CHY3402**
B2.	Apply learnt knowledge to unseen problems	**CHY1101, CHY1102, CHY1201,CHY1202, CHY1301, CHY1401, CHY2001**, ***CHY2002,*** **CHY2003**, **CHY2101,** *CHY2102*, **CHY2201, CHY2301, CHY2401, CHY3101, CHY3201, CHY3301, CHY3401, CHY3402**
B3.	Analyse and interpret data	**CHY1102, CHY1201, CHY1202, CHY1301, CHY1401, CHY2001**, **CHY2101,** *CHY2102*, **CHY2201, CHY2301, CHY2401,** *CHY3001, CHY3002*, **CHY3101, CHY3201, CHY3301, CHY3401, CHY3402**
B4.	Independently plan and undertake a project	*CHY3001, CHY3002*
C1.	Work safely and independently in a laboratory	**CHY1101, CHY1102, CHY1201, CHY1301, CHY2101, CHY2201, CHY2301,** , *CHY3001*
C2.	Plan and undertake an advanced practical course or non-lab project	*CHY3001, CHY3002*
C3.	Work on a project in an industrial environment	**Placement in Industry**
D1.	Communicate and express ideas orally and in writing	**CHY1101, CHY1102, CHY1201, CHY1202, CHY1301, CHY1401, CHY2001**, ***CHY2002***, **CHY2003**, **CHY2101,** *CHY2102*, **CHY2201, CHY2301, CHY2401,** *CHY3001, CHY3002***, CHY3101, CHY3201, CHY3301**, **CHY3401, CHY3402**
D2.	Work in a group environment	**CHY2001, CHY3401, CHY3402**
D3.	Manage time and complete work to deadlines	**CHY1101, CHY1201, CHY1301, CHY1401, CHY2001**, **CHY2101,** *CHY2102*, **CHY2201, CHY2301, CHY2401,** *CHY3001, CHY3002***, CHY3101, CHY3201, CHY3301, CHY3401, CHY3402**
D4.	Assess and form an opinion of other	**CHY2001, CHY2101**, *CHY3001, CHY3002*

	people's work	
D5.	Find information from a range of sources	*CHY2102*, *CHY3001, CHY3002*, **CHY3101, CHY3201, CHY3301, CHY3401, CHY3402**
D6.	Be self-reliant	*CHY3001, CHY3002*
D7.	Critically evaluate data and use when required	*CHY3001, CHY3002,* **CHY3401, CHY3402**