UNIVERSITY OF NEWCASTLE UPON TYNE

FACULTY OF SCIENCE, AGRICULTURE & ENGINEERING

DEGREE PROGRAMME SPECIFICATION

1 Awarding institution	University of Newcastle upon Tyne
2 Teaching institution	University of Newcastle upon Tyne
3 Programme accredited by	
4 Final award	MChem
5 Programme	Chemistry with Study in North America
6 UCAS code	F105
7 Relevant QAA subject benchmarking group	Chemistry
8 Date of revision	September 2004

9 Programme Aims

The degree programme aims to enthuse students to chemistry by educating them with a thorough understanding of organic, inorganic and physical chemistry, including advanced topics; to demonstrate how chemical principles can be applied to processes and systems; to equip students with the skills to do research at both experimental and theoretical levels; to enable students to experience the culture of North America; to provide training in problem solving, communication skills, numeracy and information technology, and to equip students with skills that enable them to pursue careers in chemistry research, chemistry-related disciplines or other professions.

10 Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate intended learning outcomes in the following areas:

A Knowledge and understanding of

1 The three main branches of chemistry (inorganic, physical and organic)

2 Practical laboratory chemistry

3 Data analysis and numeracy

4 Spectroscopy and chemical characterisation

5 Specialist aspects of chemistry

6 Research methods

Teaching and learning methods and strategies

Students acquire understanding and knowledge (the complexity of which increases as the course progresses) through lectures, tutorials and workshops (**A1, A5**). 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 they also 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 whilst in America (**A1**- **A4**). They learn **A5** in stage 4 lecture modules and **A6** through the training sessions as part of the Research Project. 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.

Assessment methods and strategies

Knowledge and understanding is assessed through unseen written examinations and in-course assessments (**A1**, **A3** – **A5**), answers to questions in practical reports (**A2**), and oral examinations e.g. in the stage 4 project (**A2**)

B Practical Skills – able to

1 Work safely and independently in a chemistry laboratory

2 Plan and undertake an advanced practical course

3 Plan and undertake a research project

Teaching and learning methods and strategies

Students receive close supervision from a demonstrator or member 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 (**B1**). At stages 1 and 2 detailed experimental procedures are presented in laboratory manuals. At stage 3 the students learn to plan and design the experiments as part of the practical chemistry modules, they work with a greater level of independence and perform more technically demanding procedures. By stage 4 they are able to work in a research laboratory and demonstrate competence in advanced laboratory techniques.

Assessment methods and strategies

The skill **B1** is assessed by laboratory write-ups. At stage 3 the student's practical competence is assessed in the advanced practical chemistry modules (**B1**). **B2** and **B3** are assessed as part of the stage 4 project.

C Cognitive skills - able to

1 Critically evaluate data

2 Apply learnt knowledge to unseen problems

3 Analyse and interpret data

4 Independently plan and undertake practical and research projects

Teaching and learning methods and strategies

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. **C2** and **C3** are progressively developed and enable the students to solve challenging problems (Stage 1 in Data Handling, Stage 2 in Group Assignment) which cross the boundaries of the chemistry modules studied earlier. Tutorials facilitate individual and group participation in answering problems. Students develop skills **C1** and **C4** during their stage 4 project work.

Assessment methods and strategies

Problem solving components of examinations and oral responses to either problems or tasks (tutorials) are used to test skills **C1** - **C3**. Laboratory reports assess **C3**. Write up of independent stage 4 projects allows students to demonstrate, and be assessed in cognitive skills **C1** - **C4**

D Key skills - able to

1 Communicate and express clearly ideas both orally and in writing

2 Work in a group environment

3 Manage time and complete work to deadlines

4 Assess and form an opinion of other people's work

5 Find information from a range of sources

6 Be self-reliant

7 Critically evaluate data and use when required.

Teaching and learning methods and strategies

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 further develop skills **D1, D3 – D5** and practise skills **D6** and **D7** during the stage 3 advanced practical chemistry modules and Stage 4 project. Solving challenging unseen problems at Stage 3 and the research project at Stage 4 develops skill **D7**.

Assessment methods and strategies

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 4 projects evaluate skills **D1** - **D7**.

11. Programme Features, Curriculum and Structure

The degree programme is offered full-time (4 years). Arrows indicate the entry and progression points. A number of option modules are open for each year of study and are chosen by the student in consultation with their personal tutor. 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. A special feature of this course is that students study stage 3 in a University in North America; the curriculum shown below is an example of the modules studied, another feature is that they undertake research training and do a research project in an area of chemistry of their choosing at stage 4.

Stage 4

Compulsory Modules

CHY498 Research Project (80)

Option Modules

CHY411 Organic Synthesis for Drug Targets (10)
CHY415 Further inorganic Chemistry
CHY425 Chemical Sensors (10)
CHY435 Electron Transfer Processes (10)
CHY445 Applied Photochemistry (10)
CHY421 Catalyst Application and Design (10)
CHY452 Advanced Methods in Drug Discovery (10)

MChem (Honours) Degree

Degree classification is determined by the averaging method and is based on stage 2, 3 and 4 marks (1:2:2)
Outcomes developed and assessed:
B1-3; C1-4; D1-7
Knowledge outcomes developed as indicated by module titles

Stage 3

Compulsory Modules

CHEM303 Ionic Equilibria (0.5)
CHEM305/305L Atmospheric Chemistry and Physics (0.5+0.25)
CHEM310/310L Inorganic Transition Metal Chemistry (0.5+0.25)
CHEM323 Analytical Instrumentation (0.5)
CHEM333 Metabolism (0.5)
CHEM334 Biochemistry Laboratory (0.25)
CHEM350/350L Intermediate Physical Chemistry (0.5+0.25)
CHEM360/360L Organic Chemistry (0.5+0.5)
(5 credits = 120 credits at Newcastle)

Progression requirements

Equivalent of 360 credits

Outcomes developed and assessed: B1, 2; C1-4; D1-7

Knowledge outcomes developed as indicated by module titles.

Stage 2

Compulsory Modules

CHY201 Group Assignment in Chemistry or Medicinal Chemistry (20)
CHY220 Physical Chemistry (20)
CHY230 Inorganic Chemistry (20)
CHY210 Organic Chemistry (20)
CHY240 Structural Chemistry (20)
CHY277 Topics in Chemistry (10)

Options Modules

CHY204 Medicinal Plants (10)
CHY274 Landmarks in Chemistry (10)

Progression requirements

240 Credits

Outcomes developed and assessed:
B1; C2,3; D1-5

Knowledge outcomes developed as indicated by module titles.

Stage 1

Compulsory Modules

CHY115 Basic Organic Chemistry (20)
CHY120 Elements of Physical Chemistry (20)
CHY135 Structural and Inorganic Chemistry (20)
CHY101 Fundamentals of Chemistry (10)
CHY106 Fundamentals of Biological and Medicinal Chemistry (10)
CHY180 Data Handling in Chemistry (20)

Option Modules

SFY001 Basic Mathematics (10)
SFY003 Fundamentals Mathematics (10)
BIO103 Form and Function-Cells and Animals (20)
PHY106 Our view of the Universe (10)
ACC102 Introduction to Information Technology (10)
CSC600 Computer Applications (20)
CSC161 Problem Solving Programme Design and Implementation (20)

Progression requirements

120 Credits

Outcomes developed and assessed:
B1; C2,3; D1, 3

Knowledge outcomes developed as indicated by module titles. A3 is covered in CHY115, CHY120, CHY135, CHY180

C Programme Curriculum
(Insert Regulations as given on University web site – currently being updated)

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	**CHY101, CHY115, CHY120, CHY135, CHY180, CHY201**, *CHY204*, **CHY210, CHY220, CHY230, CHY240,** *CHY274*, **CHY277**, **CHEM305, CHEM310, CHEM350, CHEM360, CHEM496**, *CHY411*, *CHY415*, *CHY421*, *CHY425*, *CHY435*, *CHY445*, *CHY452***, CHY498**
A2: Practical laboratory chemistry	**CHY106, CHY115, CHY120, CHY135, CHY210, CHY220, CHY230, CHY240, CHEM496**, **CHY498**
A3: Data analysis and numeracy	**CHY101**, **CHY115, CHY120, CHY135, CHY180**, *CHY204*, **CHY210, CHY220, CHY230, CHY240**, **CHY277, CHEM496**, *CHY411*, *CHY415*, *CHY425*, *CHY435*, *CHY445*, *CHY452***, CHY498**
A4. Spectroscopy and chemical characterisation	**CHY101**, **CHY120, CHY135, CHY201**, **CHY210, CHY220, CHY230, CHY240**, **CHY277**, **CHEM496** *CHY425*, **CHY498**
A5. Specialists aspects of chemistry	*CHY274***,** *CHY411*, *CHY415*, *CHY421*, *CHY425*, *CHY435*, *CHY445*, *CHY452*, **CHY498**
A6. Research methods	**CHEM496, CHY498**
B1: Work safely and independently in a laboratory	**CHY106, CHY115, CHY120, CHY135, CHY210, CHY220, CHY230, , CHY394**, **CHY498**
B2: Plan and undertake an advanced practical course	**CHY394**
B3. Plan and undertake a research project	**CHY498**
C1. Critically evaluate data	**CHEM305**, **CHEM496**, *CHY421*, *CHY425*, *CHY435*
C2. Apply learnt knowledge to unseen problems	**CHY101, CHY106, CHY115, CHY120, CHY135, CHY180, CHY201**, *CHY204*, **CHY210, CHY220, CHY230, CHY240,** *CHY274*, **CHY277**, **CHY300, CHY301, CHY310, CHY320, CHY330,** *CHY411*, *CHY415*, *CHY421*, *CHY425*, *CHY435*, *CHY445*
C3. Analyse and interpret data	**CHY101, CHY106, CHY120, CHY135, CHY180, CHY201**, *CHY204*, **CHY210, CHY220, CHY230, CHY240**, **CHEM305, CHEM310, CHEM350, CHEM496**, *CHY411*, *CHY425*, *CHY435*, *CHY445*, **CHY498**
C4. Independently plan and undertake a project	**CHY201**, **CHEM496**
D1. Communicate and express ideas orally and in writing	**CHY101, CHY106, CHY115, CHY120, CHY135, CHY180, CHY201**, *CHY204*, **CHY210, CHY220, CHY230, CHY240,** *CHY274*, **CHY277**, **CHEM305, CHEM310, CHEM350, CHEM360, CHEM496**
D2. Work in a group environment	**CHY201**
D3. Manage time and complete work to deadlines	**CHY115, CHY120, CHY135, CHY180, CHY201**, *CHY204*, **CHY210, CHY220, CHY230, CHY240, CHEM305, CHEM310, CHEM350, CHEM360, CHEM496**
D4. Assess and form an opinion of other people's work	**CHY201, CHY210**, **CHY394**
D5. Find information from a range of sources	*CHY204*, **CHEM360, CHEM496**
D6. Be self-reliant	**CHY394**, **CHY498**
D7. Critically evaluate data and use when required	**CHEM360, CHEM496**, *CHY425*, *CHY445*, **CHY498**

12 Criteria for Admission:

Standard entrance criteria

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.

Applicants with non-standard qualifications

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

Admissions Policy

Upon receipt of a UCAS application form offers of places are made to suitably qualified candidates. The standard offer for this programme is BCC including Chemistry at A Level. UK - based applicants are invited to visit Chemistry on an Open Day. During the day they will have a tour of Chemistry, the City and, weather permitting, the Campus. They are shown a purpose made video about studying chemistry at Newcastle and meet students and staff. 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.

13 Support for Students and their Learning:

Induction
The first week of the first term/semester is an Induction Week with no formal teaching. During this period all students will be given detailed programme information relating to their Stage and the timetable of lectures/practicals/labs/ tutorials/etc. In particular all new students will be given general information about the School and their course, as described in the Degree Programme Handbook. The International Office offers an additional induction programme for overseas students (see http://www.ncl.ac.uk/international/coming_to_newcastle/orientation.phtml).
There is an Induction Week Programme in Natural Sciences which includes social events as well as informative presentations about the course, facilities and student support. Each student receives a Welcome Package, including book vouchers, laboratory coat, Periodic Table 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.

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.phtml. In addition the University offers a range of support services, including the Student Advice Centre, the Student Counselling Service, the Mature Student Support Service, and a Childcare Support Officer, see http://www.ncl.ac.uk/undergraduate/support/welfare.phtml.

Support for Special Needs
Support for students with special needs is provided as required and the University's Disability Support Service can be consulted where appropriate. For further details see http://www.ncl.ac.uk/undergraduate/support/disability.phtml.

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/undergraduate/support/acfacilities.phtml.
All new students whose first language is not English are required to take an English Language test 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 exchanges. See http://www.ncl.ac.uk/undergraduate/support/langcen.phtml.

14 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

Student opinion about the modules is gathered annually. All stages of the Programme are evaluated by means of module and Stage Reviews.

The School operates a system of Peer Observation of teaching activities following the Guidelines issued by the University's Quality and Standards Unit.

The Board of Studies conducts an annual review of the programme. The Board considers the comments and recommendations of the External Examiners. Graduate surveys are conducted for consideration. The Board will consider comments and recommendations arising from any subject reviews.

The Director of Teaching (who is also the Chair of the Board of Studies) and/or Degree Programme Director is available to discuss academic issues with students throughout the course with a view to improving the quality and standard of teaching and learning. The External Examiners confirm that the standards are appropriate on an annual basis.

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 under Reserved Business, in the absence of the student representatives. The Board responds to these reports through Faculty Teaching and Learning Committee.

Accreditation reports
Non applicable.

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.

Feedback mechanisms
Feedback to students is effected 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 programme, see http://www.ncl.ac.uk/internal/academic-quality/qualityhome.htm#2.

15 Regulation of Assessment:

Pass Marks
The pass mark, as defined in the University's Undergraduate Examination Conventions (http://www.ncl.ac.uk/calendar/university.regs/ugexamconv.html), is 40.

Course Requirements
Progression is subject to the University's Undergraduate Progress Regulations (http://www.ncl.ac.uk/calendar/university.regs/ugcont.html) and Undergraduate Examination Conventions (http://www.ncl.ac.uk/calendar/university.regs/ugexamconv.html). In summary, students must pass 120 credits at each Stage. Limited compensation down to 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 (http://www.ncl.ac.uk/calendar/university.regs/ugcont.html), 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 June Board of Examiners
Report to the University on the standards of the programme

16 Indicators of Quality and Standards:

Professional Accreditation Reports
This will be subject-specific. Possible entries are
Not applicable
or
This programme was accredited by <Name of accrediting body> in <Month, year of accreditation>.

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 Subject Review in April 2004 and was judged to be Excellent/Satisfactory..

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.

17 Other Sources of Information:

The University Prospectus (see http://www.ncl.ac.uk/undergraduate/)

The Departmental Prospectus (see http://www.ncl.ac.uk/undergraduate/subjects/xxx)

The University and Degree Programme Regulations (see http://www.ncl.ac.uk/calendar/pdf/uniregs.pdf and http://www.ncl.ac.uk/calendar/sae/)

The Degree Programme Handbook

QAA Subject Review Report