

PROGRAMME SPECIFICATION

1	Awarding Institution	Newcastle University
2	Teaching Institution	Newcastle University
3	Final Award	BSc
4	Programme Title	Chemistry with Medicinal Chemistry with Industrial Training
5	UCAS/Programme Code	F122
6	Programme Accreditation	
7	QAA Subject Benchmark(s)	Chemistry
8	FHEQ Level	Level 6
9	Last updated	June 2012

10	Programme Aims	
1	to enthuse students to chemistry and medicinal chemistry by educating them with a thorough understanding of organic, inorganic and medicinal, core physical and essential biological 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:	
	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 Medicinal and biological chemistry	
	A7 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, A6). 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, A6) and improve on skill A3 . At Stage 3 the students learn advanced practical methods and specialist theoretical material (A1 – A4, A6). 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/learned work. Reading lists are provided to facilitate this. They develop A7 in modules throughout this programme, particularly related to biology, medicine and materials. Specialist aspects related to their placement	

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 Advanced Chemistry modules (A2), They should gain practical experience in industrial chemistry (A5) during their placement.
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 Stage 3 practicals within the Advanced Chemistry modules.
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 . Aspects of Stage 3 laboratories within the Advanced Chemistry modules allow 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. C3 Work on a project in an industrial environment.
Teaching and Learning Methods
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 (C1). At Stages 1 and 2 detailed experimental procedures are presented in laboratory manuals. On placement and in Stage 3 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.
Assessment Strategy
The skill C1 is assessed by laboratory write-ups. At Stage 3 the student's practical competence is tested within the Advanced Chemistry modules and is assessed as part of the Stage 3 practical module (C1 and C2). C3 is the placement in Industry.
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 further develop skills **D1, D3 – D5** and practise skills **D6** and **D7** during the practical component of Stage 3 Advanced Chemistry module. Solving challenging unseen problems at Stage 3 also develops skill **D7**.

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 practicals within the Advanced Chemistry modules evaluates skills **D1 - D7**. In some modules (Bioactive Natural Products and Chemical Biology) students have to summarize their understanding of aspects of the literature in the form of a poster.

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)

A special feature of the 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. Specialised topics are taught that are related to medicinal chemistry.

A number of modules at Stage 1 allow students to take subjects that they have not studied before at A-level (or equivalent). Specific modules are core to all the chemistry degrees and allow a student to transfer from one degree programme to another. For example, transfer to Chemistry with Medicinal Chemistry programme is possible at the end of Stage 1. Students may also transfer into the MChem programme up to the start of Stage 3. All transfers are subject to a student's academic performance. The Group Assignment (Stage 2) module encourages the development of team-work and allows students the freedom to produce their own work on a chemistry-related topic. Peer-assessment is an integral part of the module. A major part of the Structural Chemistry module (Stage 2) is based on X-ray crystallography and the solving of actual structures. Problem solving is an integral part of many modules and at Stage 4 there is a dedicated module that uses learnt organic, inorganic and physical chemistry to solve unseen literature-based problems. The Advanced Practical Laboratory (Stage 4) contains open-ended experiments and introduces students to new chemistry practice. For example, the use of liquid ammonia as a solvent is introduced in the Inorganic Practical. The degree is recognised by the Royal Society of Chemistry.

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 ABB-BBB including Chemistry and preferably Mathematics or another science subject at A Level. GCSE Mathematics grade B required if not offered at a higher level.

AABBB-BBBBB at Higher Grade including Chemistry at grade A and preferably Mathematics or another science subject is asked for from applicants with Scottish qualifications. Mathematics required at grade 2 standard grade (or Intermediate 2 equivalent) if not offered at a higher level. Combinations of Highers and Advanced Highers accepted.

Applicants taking the International Baccalaureate are usually asked for 32-35 points with Higher Level Chemistry at grade 6 or above. Mathematics or Mathematical Studies at standard level

grade 5 if not offered at Higher Level.

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

IELTS 6.5 (or equivalent)

14 Support for Student Learning

The Student Services portal provides links to key services and other information and is available at: <http://www.ncl.ac.uk/students/>

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.

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.

Numeracy support is available through Maths Aid and help with academic writing is available from the Writing Development Centre (further information is available from the Robinson Library).

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. In addition the University offers a range of support services, including one-to-one counselling and guidance or group sessions / workshops on a range of topics, such as emotional issues e.g. Stress and anxiety, student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues. Furthermore, the Student Union operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues etc.

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.

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.

All new students whose first language is not English are required to take an English Language Proficiency Test. This is administered by INTO Newcastle University Centre on behalf of Newcastle University. Where appropriate, in-session language training can be provided. The INTO Newcastle University Centre houses a range of resources which may be particularly appropriate for those interested in an Erasmus exchange.

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 Board of Studies and/or the School Learning, Teaching and Student Experience Committee. 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 Learning, Teaching and Student Experience Committee.

Programme reviews

The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Learning, Teaching and Student Experience Committee. The FLTSEC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the University Learning, Teaching and Student Experience Committee.

External Examiner reports

External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Learning, Teaching and Student Experience 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 students' views on the quality of the learning and teaching. The results from student surveys are considered as part of the Annual Monitoring and Review of the programme and any arising actions are captured at programme and School / institutional level and reported to the appropriate body.

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. Every six years degree programmes in each subject area are subject to periodic review. This involves both the detailed consideration of a range of documentation, and a one-day review visit by a review team which includes an external subject specialist in addition to University and Faculty representatives. Following the review a report is produced, which forms the basis for a decision by University Learning, Teaching and Student Experience Committee on whether the programmes reviewed should be re-approved for a further six year period.

Accreditation reports

Additional mechanisms
n/a

16 Regulation of assessment

Pass mark

The pass mark is 40%

Course requirements

Progression is subject to the University's Undergraduate Progress Regulations and Undergraduate Examination Conventions. 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 re-assessment opportunities, with certain restrictions.

Weighting of stages

The marks from **Stages 2 and 3** will contribute to the final classification of the degree
The weighting of marks contributing to the degree for **Stages 2 and 3 is 2:1**.

Common Marking Scheme

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

	Modules used for degree classification (DC)	Modules not used for degree classification
<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 Learning, Teaching and Student Experience Committee, following recommendation from the Board of Studies. The External Examiner is expected to:

- i. See and approve assessment papers
- ii. Moderate examination and coursework marking
- iii. Attend the Board of Examiners
- iv. Report to the University on the standards of the programme

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

The University Prospectus: <http://www.ncl.ac.uk/undergraduate/>

The School Brochure: <http://www.ncl.ac.uk/marketing/services/print/publications/ordering/>

Degree Programme and University Regulations: <http://www.ncl.ac.uk/regulations/docs/>

The Degree Programme Handbook <http://www.ncl.ac.uk/chemistry/undergrad/degrees/>

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.

Mapping of Intended Learning Outcomes onto Curriculum/Modules

Either

Intended Learning Outcome	Module codes (Compulsory in Bold)
A1 The three main branches of chemistry (inorganic, physical and organic)	CHY1101, CHY1201, CHY1203, CHY1204, CHY1301, CHY1401, CHY2001, CHY2101, CHY2102, CHY2103, CHY2201, CHY2301, CHY2401, CHY3007, CHY3108, CHY3306
A2 Practical laboratory chemistry	CHY1101, CHY1102, CHY1201, CHY1301, CHY2101, CHY2201, CHY2301, CHY3108, CHY3109, CHY3306
A3 Data analysis and numeracy	CHY1101, CHY1201, CHY1202, CHY1301, CHY1401, CHY2101, CHY2102, CHY2201, CHY2301, CHY2401, CHY3007, CHY3108, CHY3109, CHY3306
A4 Spectroscopy and chemical characterisation	CHY1201, CHY1202, CHY1301, CHY2001, CHY2101, CHY2201, CHY2301, CHY2401, CHY3007, CHY3108, CHY3109, CHY3306
A5 Some aspects of industrial chemistry	Placement in Industry
A6 Medicinal and biological chemistry	CHY2103, CHY3007, CHY3108, CHY3109
A7 Develop an awareness of issues in chemistry related to other disciplines	CHY1101, CHY1102, CHY1201, CHY1301, CHY2003, CHY2101, CHY2102, CHY2201, CHY2301, CHY3108, CHY3109, CHY3306, CHY3401, CHY3402
B1 Critically evaluate data, including using computer software and models	CHY3007, CHY3108, CHY3109, CHY3306
B2 Apply learnt knowledge to unseen problems	CHY1101, CHY1102, CHY1201, CHY1203, CHY1204, CHY1301, CHY1401, CHY2001, CHY2101, CHY2102, CHY2103, CHY2201, CHY2301, CHY2401, CHY3007, CHY3108, CHY3109, CHY3306, CHY3401
B3 Analyse and interpret data, in terms of current underlying theory	CHY1102, CHY1201, CHY1203, CHY1204, CHY1301, CHY1401, CHY2001, CHY2101, CHY2102, CHY2103, CHY2201, CHY2301, CHY2401, CHY3007, CHY3108, CHY3109, CHY3306
B4 Independently plan and undertake a project	CHY2001, CHY3108, CHY3109, CHY3306
C1 Work safely and independently in a chemistry laboratory	CHY1101, CHY1102, CHY1201, CHY1301, CHY2101, CHY2201, CHY2301, CHY3108, CHY3109, CHY3306
C2 Plan and undertake an advanced practical course.	CHY3108, CHY3109, CHY3306
C3 Work on a project in an industrial environment.	Placement in Industry
D1 Communicate and express clearly ideas both orally and in writing	CHY1101, CHY1102, CHY1201, CHY1203, CHY1204, CHY1301, CHY1401, CHY2001, CHY2101, CHY2102, CHY2103, CHY2201, CHY2301, CHY2401, CHY3108, CHY3109, CHY3306
D2 Work in a group environment	CHY2001, CHY3401
D3 Manage time and complete work to deadlines	CHY1101, CHY1201, CHY1301, CHY1401, CHY2001, CHY2102, CHY2101, CHY2201, CHY2301, CHY2401, CHY3108, CHY3109, CHY3306, CHY3401
D4 Assess and form an opinion of other	CHY2001, CHY2101, CHY3108, CHY3109,

	people's work including numeracy and mathematical skills.	CHY3306
D5	Find information from a range of sources	CHY2001, CHY2102, CHY3009, CHY3007, CHY3108, CHY3109, CHY3306
D6	Be self-reliant	CHY3108, CHY3109, CHY3306
D7	Critically evaluate data to solve chemical problems	CHY3108, CHY3109, CHY3306