

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	Level 6
9	Last updated	July 2013

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:

- 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 advanced practical course housed in the relevant IOP modules (**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 sessions housed in the separate IOP 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**. 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.
- 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 sessions (housed within the relevant IOP modules) 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 in the Advanced Practical laboratory in CHY3108, CHY3206 and CHY3306 (**C1**). **C2** is assessed as part of the Stage 3 Advanced Practical sessions within the relevant IOP modules 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), Structural Chemistry 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 sessions within CHY3108, CHY3206 and CHY3306. Solving challenging unseen problems at Stage 3 also develops skill **D7**. In Bioactive Natural Products students have to summarize their understanding of aspects of the literature in the form of an assignment.

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 Chemistry modules evaluate 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.

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

The main special feature of this programme is that the students spend a year working in the chemical industry between Stages 2 and 3. A student will find his/her own placement on a competitive basis and obtain the position by interview with a company. The year in industry is not assessed. 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 a major part of many modules and at Stage 3 there is a dedicated module that uses learnt organic, inorganic and physical chemistry to solve unseen literature-based problems. The Advanced Practical Laboratory (Stage 3) 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

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

AABBB at Higher Grade including Chemistry and preferably Mathematics or another science subject. 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 34 points including Higher Level Chemistry grade 6 or above. Standard Level Mathematics or Mathematical Studies required at 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. 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

For this degree you will need a minimum score of 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://my.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

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

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

Intended Learning Outcome	Module codes (Compulsory in Bold)
A1 The three main branches of chemistry (inorganic, physical and organic)	CHY1101, CHY1201, CHY1205, CHY1204, CHY1301, CHY1402, CHY2001, CHY2003, CHY2101, CHY2102, CHY2201, CHY2301, CHY2401, CHY3108, CHY3206, CHY3306, CHY3401, CHY3402
A2 Practical laboratory chemistry	CHY1101, CHY1102, CHY1201, CHY1301, CHY2101, CHY2201, CHY2301, CHY2401, CHY3108, CHY3206, CHY3306
A3 Data analysis and numeracy	CHY1101, CHY1201, CHY1205, CHY1204, CHY1301, CHY1402, CHY2003, CHY2101, CHY2102, CHY2201, CHY2301, CHY2401, CHY3108, CHY3206, CHY3306, CHY3402
A4 Spectroscopy and chemical characterisation	CHY1201, CHY1202, CHY1301, CHY2001, CHY2003, CHY2101, CHY2201, CHY2301, CHY2401, CHY3108, CHY3206, CHY3306, CHY3401, CHY3402
A5 Some aspects of industrial chemistry	Placement in Industry
A6 Develop an awareness of issues in chemistry related to other disciplines	CHY1101, CHY1102, CHY1201, CHY1301, CHY2003, CHY2101, CHY2102, CHY2201, CHY2301, CHY3108, CHY3206, CHY3306, CHY3401, CHY3402
B1 Critically evaluate data including using computer software and models	CHY3108, CHY3206, CHY3306, CHY3401, CHY3402
B2 Apply learnt knowledge to unseen problems	CHY1101, CHY1102, CHY1201, CHY1205, CHY1204, CHY1301, CHY1402, CHY2001, CHY2003, CHY2101, CHY2102, CHY2201, CHY2301, CHY2401, CHY3108, CHY3206, CHY3306, CHY3401, CHY3402
B3 Analyse and interpret data in terms of current underlying theory	CHY1102, CHY1201, CHY1205, CHY1204, CHY1301, CHY1402, CHY2001, CHY2101, CHY2102, CHY2201, CHY2301, CHY2401, CHY3108, CHY3206, CHY3306, CHY3401, CHY3402
B4 Independently plan and undertake a project	CHY3108, CHY3206, CHY3306,
C1 Work safely and independently in a chemistry laboratory	CHY1101, CHY1102, CHY1201, CHY1301, CHY2101, CHY2201, CHY2301, CHY3108, CHY3206, CHY3306,
C2 Plan and undertake an advanced practical course	CHY3108, CHY3206, 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, CHY1205, CHY1204, CHY1301, CHY1402, CHY2001, CHY2003, CHY2101, CHY2102, CHY2201, CHY2301, CHY2401, CHY3108, CHY3206, CHY3306, CHY3401, CHY3402
D2 Work in a group environment	CHY2001, CHY3401, CHY3402
D3 Manage time and complete work to	CHY1101, CHY1201, CHY1205, CHY1204,

deadlines	CHY1301, CHY1402, CHY2001, CHY2101, CHY2102, CHY2201, CHY2301, CHY2401, CHY3009, CHY3108, CHY3206, CHY3306, CHY3401, CHY3402
D4 Assess and form an opinion of other people's work including numeracy and mathematical skills	CHY2001, CHY2101, CHY3108, CHY3206, CHY3306
D5 Find information from a range of sources	CHY2102, CHY3009, CHY3108, CHY3206, CHY3306, CHY3401, CHY3402
D6 Be self-reliant	CHY3108, CHY3206, CHY3306,
D7 Critically evaluate data to solve chemical problems	CHY3108, CHY3206, CHY3306, CHY3401, CHY3402