

PROGRAMME SPECIFICATION

1	Awarding Institution	Newcastle University
2	Teaching Institution	Newcastle University
3	Final Award	BSc Hons
4	Programme Title	Chemistry Chemistry with Industrial Training Chemistry with Study Abroad
5	Programme Code	F100, F102 F109
6	Programme Accreditation	RSC (Currently only applies to F100 and F102)
7	QAA Subject Benchmark(s)	Chemistry
8	FHEQ Level	Level 6
9	Last updated	May 2023

10 Programme Aims

- 1 to enthuse students to chemistry by educating them with a thorough understanding of organic, inorganic and physical chemistry, including the 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 equip students with skills that enable them to pursue careers in chemistry, chemistry-related disciplines or other professions;
- 5 to develop students' practical skills including assessing risks so they can work in the laboratory safely.
- 6 to provide the opportunity for students to apply their skills in an industrial environment
- 7 to provide students with the opportunity to study chemistry in a prestigious university in another country and experience the culture of that country for a year

For students on the Careers Placement Year programme:

- 8 provide students with the experience of seeking and securing a position with an employer.
- 9 facilitate independent self-management and proactive interaction in a non-university setting
- 10 provide a period of practical work experience that will benefit current academic study and longer term career plans
- 11 enable students to ethically apply their knowledge and skills in the work place, reflect upon their development and effectively evidence and articulate their learning in relevant future settings

For students on the International Study Abroad programme:

- 12 Offer students the opportunity to develop graduate attributes which increase employability, particularly communication and (where applicable) language skills, intercultural competencies, adaptability, resilience and global awareness.
- 13 Gain insight into international Higher Education and experience differences in academic approach and learning environment.

14 Provide the opportunity to experience new areas of study outside of their usual programme of study at Newcastle University.

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, computational methods
- A5 Chemistry related issues with an awareness of the relation with other disciplines

For students on the Careers Placement Year programme:

- A6 Some aspects of industrial chemistry
- A7 Apply personal and professional development strategies to prioritise, plan and manage their own skills, development and learning.
- A8 Research, select and apply relevant knowledge aimed at enhancing their own skills and effectiveness in specific duties at their placement
- A9 Demonstrate an understanding of a work environment, how it functions and their contribution to it
- A10 Relate their work based learning to other areas of personal development, including academic performance

For students on the International Study Abroad programme:

- A11 Demonstrate the ability to adapt to different learning environments.

<p>Teaching and Learning Methods</p> <p>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 also 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 more specialist theoretical material (A1 - A4,). On placement the students learn A6. 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 A5 in modules throughout the programme, particularly related to biology, medicinal and materials. Specialist aspects are covered at Stage 3.</p> <p>Specialist aspects related to their placement are covered during their year in industry (A6-A10) via interaction with industrial supervisors supported by the academic placement lead.</p>
<p>Assessment Strategy</p> <p>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 e.g. in the advanced practical course housed in the relevant IOP modules (A2), and the working in Industry (A7).</p>
<p>Intellectual Skills</p> <p>On completing the programme students should be able to:</p> <p>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</p>
<p>Teaching and Learning Methods</p> <p>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 Analytical Methods and their Applications, Stage 2 in Professional Development and Employability Skills and Stage 3 Research Literature Project 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 practical sessions housed in the Advanced Chemistry modules and during their placement. Students develop skills B1 and B4 during their project work while in Industry or in a chemistry research laboratory abroad.</p>
<p>Assessment Strategy</p> <p>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 Advanced Practical Chemistry modules (housed in the relevant IOP modules) and the Research Literature Project allow students to demonstrate and be assessed in cognitive skills B1 - B4.</p>
<p>Practical Skills</p> <p>On completing the programme students should be able to:</p> <p>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 or in a research laboratory abroad.</p>
<p>Teaching and Learning Methods</p>

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 sessions (**C1, C2**).

C3 is the placement in Industry or in a research laboratory abroad, but is not formally assessed as part of the degree programme.

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

For students on the Careers Placement Year programme:

- D8 Reflect on and manage own learning and development within the workplace
- D9 Use existing and new knowledge to enhance personal performance in a workplace environment, evaluate the impact and communicate this process
- D10 Use graduate skills in a professional manner in a workplace environment, evaluate the impact and communicate the personal development that has taken place.

For students on the International Study Abroad programme:

- D11 Adapt and operate in a different cultural environment

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, 'Professional Development and Employability Skills' 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 stage 1 as part of the Organic Chemistry in the context of a series of problem sheets, a practical course (Stage 2 Organic), Structural Chemistry (**D3**) and the Professional Development and Employability Skills (**D4**). Students further develop skills **D1, D3 – D6** and practise skill **D7** during the Stage 3 Advanced Practical sessions. Solving challenging unseen problems at Stage 3 also develops skill **D7**.

Students further develop skills **D1 - D3** and **D5, D6 and D8-10** when on placement in Industry or in a research laboratory abroad.

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 'Professional Development and Employability Skills' 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**. In the Research Literature Project students have to summarize their understanding of aspects of the literature in the form of a short oral presentation, a chemical communications exercise and a project plan (**D1, D3, D5 - D7**).

12 Programme Curriculum, Structure and Features

Basic structure of the programme

The degree programme is offered full-time (3 years) and with Industrial Placement or Study Abroad (if chosen) (4 years). Students have to take 120 credits at each stage for a total of 360 credits. All students take the compulsory modules outlined in each year.

Students on the Careers Placement Year / International Study Abroad programme will take their placement in the penultimate year of studies.

All placements will be undertaken in line with the University's placement policy
<http://www.ncl.ac.uk/ltts/assets/documents/qsh-workplacement-pol.pdf>

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

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 Professional Development and Employability Skills (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 Stage 3 research literature project. 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 main special feature of this programme is that the students spend a year working in the chemical industry or at a prestigious University abroad between Stages 2 and 3. A student will find his/her own industrial placement on a competitive basis and obtain the position by interview with a company. The year in industry or abroad is not assessed.

Programme regulations (link to on-line version)

F100_F102: [-RF100_F102](#)

F109: [-RF109](#)

13 Support for Student Learning

Generic information regarding University provision is available at the following link.
[Generic Information](#)

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

Generic information regarding University provision is available at the following link.
[Generic Information](#)

Accreditation reports
Royal Society of Chemistry
Additional mechanisms
n/a

15 Regulation of assessment

Generic information regarding University provision is available at the following link.
[Generic Information](#)

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

The University Prospectus: <http://www.ncl.ac.uk/undergraduate/degrees/#subject>
Degree Programme and University Regulations: <http://www.ncl.ac.uk/regulations/docs/>

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.