

**BSc Applied Chemistry**  
**For students entering Part 1 in 2014/5**

**UCAS code:**

|   |                       |
|---|-----------------------|
| Awarding Institution:                       | University of Reading |
| Teaching Institution:                       | University of Reading |
| Relevant QAA subject Benchmarking group(s): | Chemistry             |
| Faculty:                                    | Life Sciences Faculty |
| Programme length:                           | 1 years               |
| Date of specification:                      | 23/Sep/2014           |
| Programme Director:                         | Dr Elizabeth Page     |
| Programme Advisor:                          |                       |
| Board of Studies:                           | Chemistry             |
| Accreditation:                              |                       |

**Summary of programme aims**

This programme represents an articulated dual award between the University of Reading and NUIST, China by mutual credit transfer. The programme is designed to provide a broad and rigorous study of modern chemistry through an internationally coordinated teaching approach.

**Transferable skills**

During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills. In following this programme, students will have had the opportunity to develop such skills, in particular relating to communication, interpersonal skills, learning skills, research skills, numeracy, self management, use of IT and problem-solving and will have been encouraged to further develop and enhance the full set of skills through a variety of opportunities available outside their curriculum.

In addition students will be expected to fully communicate in English and to develop an ability to draw from their knowledge of chemistry and apply it in a variety of different problem-solving type applications. The training in transferable skills will be applied and enhanced within the individual research project students will carry out during their time at Reading.

**Programme content**

Students will study for 3 years on the BSc Applied Chemistry at NUIST, China. All details of the first 3 years at NUIST are available in the Operational Handbook. Students who successfully complete the first three year at NUIST and qualify according to the constraints set out in the agreement and in this programme specification will transfer to the University of Reading for the final year of their degree. This year will be identified as Year 4 or Part 3 in this document. See Operational Handbook for full details of Years 1, 2 and 3 and assessment.

*This Part is carried out in China and is exempt from classification for this programme.*

**Part 2 (4 semesters - 2 years)**

*Compulsory modules*

| Code | Title                               | Credits | Level |
|------|-------------------------------------|---------|-------|
|      | Inorganic Chemistry II              | 10      | 5     |
|      | Analytical Chemistry I              | 10      | 5     |
|      | Organic Chemistry I                 | 10      | 5     |
|      | Organic Chemistry II                | 10      | 5     |
|      | Organic Synthesis                   | 10      | 5     |
|      | Coordination Chemistry              | 10      | 5     |
|      | Instrumental Analysis               | 10      | 5     |
|      | Physical Chemistry I                | 10      | 5     |
|      | Physical Chemistry II               | 10      | 5     |
|      | Spectrum Analysis                   | 10      | 5     |
|      | Analytical Chemistry Experiment     | 4       | 5     |
|      | Organic Chemistry Experiment        | 4       | 5     |
|      | Physical Chemistry Experiment       | 4       | 5     |
|      | Instrumental Analysis Experiment    | 4       | 5     |
|      | Comprehensive Chemical Experiment I | 4       | 5     |

*Optional modules*

*Students will undertake other modules in Years 2 and 3 in China not listed here which do not count to credit*

### Part 3 (three terms)

#### Compulsory modules

| <i>Mod Code</i> | <i>Module Title</i>  | <i>Credits</i> | <i>Level</i> |
|-----------------|--|----------------|--------------|
| CH3ENG          | English Language for Chemists  | 10             | 6            |
| CH3NUI          | Health and Safety and Professional Skills                            | 10             | 6            |
| CH3PRA          | Advanced Laboratory Skills   | 20             | 6            |
| CH3PRJ          | Research Project   | 40             | 6            |
| CH3I1           | d and f block chemistry  | 10             | 6            |
| CH3O2           | Advanced Organic Chemistry - Contemporary Synthetic Methodology      | 10             | 6            |
| CH3P1           | Advanced Topics in Physical Chemistry 1                              | 10             | 6            |
| CH3AN2          | Advanced Analytical Techniques for Inorganic Structure Determination | 10             | 6            |

#### Progression requirements

To progress onto Part 3 of the Reading course students must obtain an overall average mark of 70% on all compulsory chemistry modules listed above and completed in Years 1, 2 and 3 in NUIST and gain level 6.5 in the IELTS or TEEP English Language test.

The final degree classification is calculated by taking the average mark for Part 2 compulsory modules stated in this Programme Specification (weighted as above) and converting to an equivalent Reading mark using the mark conversion agreed and detailed in the Operational Handbook. This mark will be entered against module code CH2NUI, which represents the Reading University Part 2 mark for classification purposes. This mark is then added to the average mark for the Part 3 modules (weighted according to credits) in the ratio 1:2 to get a mark out of 100.

Provided a student has attained an overall weighted average from Parts 2 and 3 as calculated above of 40% or higher and has not scored less than 40% in over 40 credits they will be eligible for a dual award.

This programme will not offer the opportunity for students to graduate with a Pass degree, a Certificate or Diploma of Higher Education.

Part 2 contributes 33% and Part 3 contributes 67% towards the final degree classification.

The University's Honours classification is as follows:

#### Mark Interpretation

70-100% First Class

60-69% Upper Second Class

50-59% Lower Second Class

40-49% Third Class

0-39% Fail

#### Assessment and classification

Teaching is organised in modules that involve a combination of lectures, tutorials, workshops and practical sessions. Modules are assessed by a mixture of coursework and formal examinations. At least 50% of the assessment will normally be by formal examination except for the Part 3 project.

#### Admission requirements

Entrants to this programme in China must satisfy the requirements of the NUIST admissions criteria. Entrants to Part 3 of the chemistry programme in Reading must obtain an average of 70% on all compulsory chemistry modules carried out in Years 1, 2 and 3 in NUIST and attain level 6.5 in the IELTS or TEEP test.

**Admissions Tutor:** Dr D Nutt (d.nutt@reading.ac.uk)

#### Support for students and their learning

University support for students and their learning falls into two categories. Learning support is provided by a wide array of services across the University, including: the University Library, the Careers, Placement and Experience Centre (CPEC), In-session English Support Programme, the Study Advice and Mathematics Support Centre teams, IT Services and the Student Access to Independent Learning (S@il) computer-based teaching and learning facilities. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student

guidance and welfare support is provided by Personal Tutors, School Senior Tutors, the Students' Union, the Medical Practice and advisers in the Student Services Centre. The Student Services Centre is housed in the Carrington Building and offers advice on accommodation, careers, disability, finance, and wellbeing, academic issues (eg problems with module selection) and exam related queries. Students can get key information and guidance from the team of Helpdesk Advisers, or make an appointment with a specialist adviser; Student Services also offer drop-in sessions and runs workshops and seminars on a range of topics. For more information see [www.reading.ac.uk/student](http://www.reading.ac.uk/student)

In order to fully support students to manage the transition from NUIST to Reading, students will be expected to attend, as a minimum, the pre-sessional English language course prior to the start of the autumn term. At NUIST, China there is equivalent support available for students who will have access to the University library, containing books and journals in both Chinese and English and a suite of well-equipped IT and multi-media teaching rooms. Student guidance is ensured by the Student Activities Support Centre in NUIST.

### **Career learning**

#### **Career prospects**

A BSc degree in Applied Chemistry from the University of Reading and NUIST, China provides a strong platform from which to undertake a wide range of careers both within the chemical community and outside and both in China and internationally. Chemists are highly valued for their numerical and problem solving skills as well as their technical knowledge. They can use their chemical knowledge as research workers, technical assistants, or sales and marketing personnel within the chemical industry. Alternatively, Chemistry graduates from Reading have found employment using their numerical and other skills in more general areas such as accounting and computing. In addition, many students with a BSc degree in chemistry pursue postgraduate work, either at Reading or elsewhere, by studying for a higher degree in specialised areas of Chemistry.

#### **Opportunities for study abroad**

Students will spend the final year of their programme in Reading. There are no other opportunities to study abroad.

### **Placement opportunities**

### **Programme Outcomes**

#### **Knowledge and Understanding**

##### **A. Knowledge and understanding of:**

1. The fundamental concepts and techniques chemistry
2. A selection of more specialist topics in the three main branches of the subject and in analytical chemistry
3. The main techniques involved in practical work
4. The spectroscopic methods used to identify molecules and to determine their structure and the basics of the underlying theory.

##### **Teaching/learning methods and strategies**

The knowledge required for the basic topics is provided in formal lectures supported by problem sets for students to tackle on their own and which are discussed formally in tutorial sessions with members of staff.

Practical classes are held throughout all years of the course in which students develop their skills prior to applying them in their project.

Feedback on student work is provided by the discussion and return of work in tutorials and by regular workshop sessions during which students tackle unseen problems in the presence of academic staff who provide support.

All practical work is marked and returned to the student.

##### *Assessment*

Most knowledge is tested through a combination of coursework and unseen formal examinations, although 3 is assessed by coursework. Dissertations and oral presentations also contribute to assessment, particularly in Part 3.

## Skills

### Skills and other attributes

#### B. Intellectual skills - *able to:*

1. Think logically
2. Analyse and solve problems
3. Organise tasks into a structured form
4. Understand the evolving state of knowledge in a rapidly developing area
5. Transfer appropriate knowledge and methods from one topic within the subject to another
6. Plan, conduct and write a report on an independent project.

#### C. Practical skills - *able to:*

1. Follow practical instructions safely and accurately
2. Carry out a variety of experimental procedures
3. Measure and interpret various spectroscopic techniques
4. Interpret quantitatively the results of their experiments
5. Formulate safety protocols
6. Devise suitable experimental methods for tackling a particular problem

#### D. Transferable skills - *able to:*

1. Use IT (word-processing, spreadsheets and chemical databases)
2. Communicate scientific ideas
3. Give oral presentations
4. Work as part of a team
5. Use of information and library resources
6. Manage time
7. Plan their career.

#### Teaching/learning methods and strategies

Logic is an essential part of the understanding and construction of synthetic methods and mechanistic pathways which form the framework for much organic and inorganic chemistry. While not exclusively the preserve of physical chemistry, problem solving plays a major part in this section of the course. Latest developments in the subject are introduced where appropriate, particularly in Part 3. Practical reports in all years provide training for the Part 3 project report.

#### Assessment

1-4 are assessed directly and indirectly in most parts of this chemistry course, while 5 contributes to the most successful work. 6 is assessed in the Part 3 project report.

#### Teaching/learning methods and strategies

Detailed practical manuals are provided for all practical courses together with sources of recommended further reading. Workshop sessions are held to assist students in interpreting spectroscopic information obtained on unknown compounds. In Part 3 students work on individual projects under the supervision of one or more members of staff.

#### Assessment

1 to 4 are tested to different extents by the practical work and reports associated with the chemistry course. 3 is assessed through problems set in written examinations. 5 is specifically assessed during the module CH3NUI in Part 3, although safe working procedures are emphasised at every stage. 3 is specifically but not exclusively assessed within core modules involving practical work and problem solving. 6 is assessed in the Part 3 project.

#### Teaching/learning methods and strategies

The use of IT is embedded throughout the programme in China and in Reading, but, is specifically addressed in the core module CH3NUI. Team work and career planning are part of module CH3ENG and CH3NUI. Oral presentations are associated with module CH3PRJ and CH3ENG. Library resources are specifically addressed within the third year project and CH3NUI and CH3ENG. Time management is essential for the timely and

effective completion of the programme.

*Assessment*

1 - 5 contribute assessed coursework within the compulsory module on analytical and professional skills, CH3NUI.

**Please note - This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the module description and in the programme handbook. The University reserves the right to modify this specification in unforeseen circumstances, or where the process of academic development and feedback from students, quality assurance process or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.**