Programme Specification: Undergraduate

Academic Year 2021/22

1. Course Summary

Names of programme and award title(s)	BSc (Hons) Chemistry BSc (Hons) Chemistry with International Year (see Annex for details) BSc (Hons) Chemistry with Industrial Placement Year (see Annex for details)
Award type	Single Honours
Mode of study	Full-time
Framework of Higher Education Qualification (FHEQ) level of final award	Level 6
Normal length of the programme	3 years; 4 years with either the International Year or Placement Year between years 2 and 3
Maximum period of registration	The normal length as specified above plus 3 years
Location of study	Keele Campus
Accreditation (if applicable)	All BSc (Hons) Chemistry single honours degrees, including the 'with International Year' and 'with Industrial Placement Year' options, are fully accredited by the Royal Society of Chemistry.
Regulator	Office for Students (OfS)
Tuition Fees	**UK students:** Fee for 2021/22 is £9,250* **International/EU students:** Fee for 2021/22 is £17,000** The fee for the international year abroad is calculated at 15% of the standard year fee The fee for the industrial placement year is calculated at 20% of the standard year fee

How this information might change: *Please read the important information at http://www.keele.ac.uk/student-agreement/. This explains how and why we may need to make changes to the information provided in this document and to help you understand how we will communicate with you if this happens.*

** These fees are regulated by Government. We reserve the right to increase fees in subsequent years of study in response to changes in government policy and/or changes to the law. If permitted by such change in policy or law, we may increase your fees by an inflationary amount or such other measure as required by government policy or the law. Please refer to the accompanying Student Terms & Conditions. Further information on fees can be found at http://www.keele.ac.uk/studentfunding/tuitionfees/*

*** We reserve the right to increase fees in subsequent years of study by an inflationary amount. Please refer to the accompanying Student Terms & Conditions for full details. Further information on fees can be found at http://www.keele.ac.uk/studentfunding/tuitionfees/*

2. What is a Single Honours programme?

The Single Honours Chemistry programme described in this document allows you to focus more or less exclusively on Chemistry. In keeping with Keele's commitment to breadth in the curriculum, the programme also gives you the opportunity to take some modules in

other disciplines and in modern foreign languages as part of a 360-credit Honours degree. Thus it enables you to gain, and be able to demonstrate, a distinctive range of graduate attributes.

These specifications refer solely to the BSc Chemistry routes. Students seeking further information on other degree routes involving Chemistry are advised to consult the relevant programme specifications. Transfers from either Combined Honours Chemistry or Combined Honours Medicinal Chemistry into Single Honours Chemistry are permitted at any point up to the first week of Semester 1 of Year 2.

Note: For clarity, this document refers to each level of study by its FHEQ level. Year 1 corresponds to Level 4, Year 2 to Level 5, Year 3 to Level 6 and Year 4 to Level 7.

FHEQ Level	BSc Chemistry	BSc Chemistry with International Year	BSc Chemistry with Industrial Placement Year
4	90 credits Chemistry	90 credits Chemistry	90 credits Chemistry
	30 credits Electives	30 credits Electives	30 credits Electives
5	105-120 credits Chemistry	105-120 credits Chemistry	105-120 credits Chemistry
	0-15 credits Electives	0-15 credits Electives	0-15 credits Electives
International Year		Equivalent of 120 credits, Pass/Fail	
Placement Year			Equivalent of 120 credits, Pass/Fail
6	120 credits Chemistry	120 credits Chemistry	120 credits Chemistry
Total	315-330 credits Chemistry 30-45 credits Electives	315-330 credits Chemistry 30-45 credits Electives	315-330 credits Chemistry 30-45 credits Electives
Degree	BSc Chemistry	BSc Chemistry with International Year	BSc Chemistry with Industrial Placement Year

3. Overview of the Programme

Chemistry is the central science, disciplined in experimental approach, highly creative in its thinking and life-enhancing in impact. The contribution of chemistry to our modern world ranges from advanced materials in gadgets, and high-tech materials used on the International Space Station, to life-saving drugs that are essential to modern medicine. The wide diversity of chemistry is reflected in teaching and research at Keele University.

In first and second year, lectures cover core material for study, introducing you to concepts that are developed in workshops and laboratory classes. Assessment is through a combination of exams and coursework including reports, presentations, and laboratory diaries. You will receive comprehensive feedback on assessed work in a variety of formats including written, audio, and face-to-face methods.

In your final year, lectures and seminars cover research-focused material. Assessment includes exams and coursework designed to further develop information retrieval and critical thinking skills. Project work is in the format of a research project module and a dissertation module. Research project work is assessed through the evaluation of the laboratory diary, an oral examination and writing of a scientific paper, whereas the dissertation module focuses on the writing of a peer-reviewed literature dissertation and the presentation of these findings. You have access throughout your degree to excellent laboratory facilities that are exceptionally well equipped with computational facilities and research grade chemical instrumentation. The structure of the programme is designed to enable you to enhance your employability through the development of problem- solving, presentational and communication skills as well as developing your research skills and your capacity to learn independently. If you take advantage of the full range of opportunities the programme offers, you will have acquired the knowledge and skills to present yourself with confidence in pursuit of your chosen career in a competitive world.

4. Aims of the programme

The broad aims of the programme are to:

- equip you with depth and breadth of chemistry knowledge,
- develop a wide range of laboratory and analytical skills,
- develop enhanced problem solving, research and communication skills.

5. What you will learn

The intended learning outcomes of the programme (what students should know, understand and be able to do at the end of the programme), can be described under the following headings:

- Subject knowledge and understanding
- Subject specific skills
- Intellectual skills
- Key or transferable skills (including employability skills)

Subject knowledge and understanding

Successful students will be able to demonstrate:

- knowledge of the major aspects of chemical terminology and vocabulary
- knowledge and understanding of fundamental physicochemical principles
- knowledge of a range of inorganic and organic materials
- understanding of general synthetic pathways, including related isolation, purification and characterisation techniques
- awareness of issues within chemistry that overlap with other related disciplines
- knowledge of selected aspects of chemistry at the forefront of the discipline
- knowledge of aspects of chemical science research methods and peer-reviewed chemical science literature

Subject specific skills

Successful students will be able to:

- demonstrate skills in the safe-handling of chemical materials, taking into account their physical and chemical properties including any specific hazards associated with their use
- conduct risk assessments
- conduct documented laboratory procedures in synthetic and analytical work, in relation to both inorganic and organic systems
- monitor, by observation and measurement, chemical properties, events or changes, with systematic and reliable recording and documentation thereof
- operate standard chemical instrumentation
- interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory

Intellectual skills

Successful students will be able to:

- demonstrate knowledge and understanding of essential chemistry-related facts, concepts, principles and theories
- apply such knowledge and understanding to the solution of qualitative and quantitative problems, both familiar and unfamiliar
- recognise and analyse problems and plan strategies for their solution
- evaluate, interpret and synthesise chemical information and data
- carry out practical application of theory using computer software and models
- communicate scientific material and arguments
- use information technology (IT) to manipulate and present chemical information and data

Key or transferable skills (including employability skills)

Successful students will be able to:

- communicate information, ideas, problems, and solutions to both specialist and non-specialist audiences orally and in writing
- demonstrate problem-solving skills, relating to qualitative and quantitative information
- demonstrate numeracy and mathematical skills, including such aspects as error analysis, order-of- magnitude estimations, correct use of units and modes of data presentation
- retrieve and cite information, in relation to primary and secondary information sources, including retrieval of information through online computer searches
- demonstrate skills in the use of information technology for presenting information and data
- interact with other people and engage in team-working, time management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working
- show development of skills and awareness necessary to seek out opportunities to undertake appropriate further training of a professional nature

Additional learning outcomes specific to BSc Chemistry with International Year

Successful students will be able to:

- Describe, discuss and reflect upon the cultural and international differences and similarities of different learning environments
- Discuss the benefits and challenges of global citizenship and internationalisation
- Explain how their perspective on their academic discipline has been influenced by locating it within an international setting
- Design, plan and critically evaluate practical investigation, record relevant information accurately and systematically and be able to reflect upon the data in critical manner
- Develop, synthesize and apply fundamental principles and solve specific problems in the context of selected scientific discipline.

Additional learning outcomes specific to BSc Chemistry with Industrial Placement Year

Successful students will be able to:

- Apply the chemical theories and laboratory skills learnt to real situations in the industrial workplace to design, plan, risk asses, and critically evaluate practical investigations
- Develop key professional skills in the accurate documentation of information; the analysis of chemical data; and the planning and safe operation of chemical processes
- Develop employability skills in the presentation and communication of data; the writing of reports; and the ability to work effectively, individually, and as part of a team
- Explain how their perspective on chemistry has been influenced by working within an industrial setting

Keele Graduate attributes

Engagement with this programme will enable you to develop your intellectual, personal and professional capabilities. At Keele, we call these our ten Graduate Attributes and they include independent thinking, synthesizing information, creative problem solving, communicating clearly, and appreciating the social, environmental and global implications of your studies and activities. Our educational programme and learning environment is designed to help you to become a well-rounded graduate who is capable of making a positive and valued contribution in a complex and rapidly changing world, whichever spheres of life you engage in after your studies are completed.

Further information about the Keele Graduate Attributes can be found here: http://www.keele.ac.uk/journey/

6. How is the programme taught?

Learning and teaching methods used on the programme vary according to the subject matter and level of the module. They include the following:

- Lectures, lecture breaks and self-tests
- Interactive personal response systems
- Screencasts
- Recorded lectures
- Tablet PCs
- Demonstrations
- Detailed personalised and generic written and face-to-face feedback
- Electronic submission and return of marked coursework (with feedback)
- Audio feedback
- Screencast feedback
- Pre-laboratory and post-laboratory exercises
- Laboratory classes
- Research projects
- Problem classes and workshops
- Team based learning
- Problem-based and context-based activities
- IT instruction (spread sheets, word-processing, chemical structure drawing, databases, textbook resources, information retrieval and literature searching)
- Group work
- Self and peer-assessment for learning
- Information literacy activities
- Computer-aided learning (simulations and animations, online activities and exercises)
- Case studies
- Chemical Sciences Seminar Series
- Use of e-learning/the Keele Learning Environment (KLE)

Apart from these formal activities, students are also provided with regular opportunities to talk through particular areas of difficulty, and any special learning needs they may have, with their Personal Tutors or module lecturers on a one-to-one basis.

7. Teaching Staff

A dynamic group of staff with a broad range of expertise teach on the programme and bring a wealth of experience acquired through fundamental and applied research across a diverse range of areas. Some current staff members are internationally recognised leaders in their field and manage research groups comprising postgraduate research students and postdoctoral researchers, some of whom contribute to the teaching on the programme. Reflecting the diverse range of research expertise, some staff members also contribute to the Forensic Science, and Applied Environmental Science programmes at Keele. Many current teaching staff hold, or are working towards an accredited Higher Education Teaching qualification and many are Fellows of the Higher Education Academy (FHEA), the professional body for teachers in Higher Education. A number of the teaching staff have established a national reputation for excellence in teaching and learning and have been recognised for their innovation in teaching through university and national teaching excellence awards, and the attraction of funding for teaching innovation projects.

The University will attempt to minimise changes to our core teaching teams, however, delivery of the programme depends on having a sufficient number of staff with the relevant expertise to ensure that the programme is taught to the appropriate academic standard.

Staff turnover, for example where key members of staff leave, fall ill or go on research leave, may result in changes to the programme's content. The University will endeavour to ensure that any impact on students is limited if such changes occur.

8. What is the structure of the Programme?

The academic year runs from September to June and is divided into two semesters. The number of weeks of teaching will vary from course to course, but you can generally expect to attend scheduled teaching sessions between the end of September and mid-December, and from mid-January to the end of April.

Course Transfers

1. You may elect to transfer from either Combined Honours Chemistry or Combined Honours Medicinal Chemistry to Single Honours Chemistry at any point up to the first week of Semester 1 of Year 2.
2. It is possible to transfer onto the following courses from BSc Chemistry according to the deadlines given. Please consult the respective programme specification for full details.

Degree Title	Duration	Transfer Deadline
BSc Chemistry with Medicinal Chemistry (Single Honours)	3 years	Transfer by week 1 of semester 1 of year 2*
MChem Chemistry (Single Honours)	4 years	Transfer by week 1 of semester 1 of year 3
MChem Chemistry with Medicinal Chemistry (Single Honours)	4 years	Transfer by week 1 of semester 1 of year 2*
* Transfer onto these programmes can also be made up to week 1 of semester 1 of year 3 if students have studied the necessary Medicinal Chemistry credits in the second year.		

Credit Requirements

Our BSc Chemistry degree course is organised into modules. Each module is usually a self-contained unit of study and each is usually assessed separately with the award of credits on the basis of 1 credit = 10 hours of student effort. An outline of the structure of the programme is provided in the tables below.

There are three types of module delivered as part of your programme. They are:

- Compulsory modules - a Chemistry module that you are required to study on this course;
- Optional modules - Chemistry modules which allow you some limited choice of what to study from a list of modules;
- Elective modules - a free choice of modules that count towards the overall credit requirement but not the number of subject-related credits.

A summary of the credit requirements per year is as follows, with a minimum of 90 Chemistry credits (compulsory plus optional) required for each year.

For further information on the content of modules currently offered, including the list of elective modules, please visit: https://www.keele.ac.uk/recordsandexams/modulecatalogue/

Year	Compulsory	Optional		Electives	
		Min	Max	Min	Max
Level 4	90	0	0	30	30
Level 5	90	15	30	0	15
Level 6	90	30	30	0	0

Module Lists

Level 4

There are three compulsory 30-credit Chemistry modules taken by single honours Chemistry students. Students also select two additional elective modules to study.

Whilst laying the foundations of the principles and vocabulary of Chemistry, you will be challenged to question knowledge and the nature of knowledge when you start to encounter problems that have more than one answer or interpretation.You will be exposed to experimental evidence from a variety of sources and start to learn how such evidence supports, undermines or otherwise, the theoretical models and ideas upon which the subject of Chemistry is built. The practical classes emphasise development of core practical skills through hands-on experience of key techniques and procedures, as well as skills in laboratory safety, maintaining a laboratory diary, observation, information retrieval, IT skills, scientific writing and reporting in a variety of formats.

Compulsory modules	Module Code	Credits	Period
Practical and Professional Chemistry Skills	CHE-10061	30	Semester 1-2
Chemical Structure and Reactivity	CHE-10063	30	Semester 1-2
Environmental and Sustainable Chemistry	CHE-10065	30	Semester 1-2

Level 5

Students will take 4 or 5 Chemistry modules with the option to select an elective. Three 30-credit Chemistry modules will be core and the remaining 15-credit Chemistry module will be selected from a choice of two optional modules.

In Year 2 the knowledge and skills acquired in Year 1 are developed with an increasing emphasis on the need to integrate knowledge and critically evaluate experimental evidence in solving theoretical and practical problems. In practical classes, new practical skills are developed and an increasing emphasis is placed on critical evaluation of experimental design and the analysis of complex data from multiple sources, including computational theoretical calculations and the scientific peer-reviewed literature. Sophisticated analytical techniques are introduced and applied to the investigation of a variety of problems, whilst communication skills are developed to include skills in oral presentation.

Compulsory modules	Module Code	Credits	Period
Molecular Chemistry and Reactions	CHE-20055	30	Semester 1-2
Spectroscopy and Analysis	CHE-20057	30	Semester 1-2
Physical and Structural Chemistry	CHE-20059	30	Semester 1-2

Optional modules	Module Code	Credits	Period
Industrial Chemistry	CHE-20037	15	Semester 1
Principles of Drug Design	CHE-20081	15	Semester 1-2

Level 5 Module Rules

- Optional modules: students must select at least one of the two optional modules, and may take an elective module.

Level 6

In semester 1 you will take three compulsory Chemistry modules and one optional module. In semester 2 you will study one compulsory Chemistry module and select one optional module. There is also 30-credits of Chemistry project work (research project and dissertation) that last the full year.

In Year 3, increasingly sophisticated theories and ideas are introduced which require you to draw upon, integrate and extend the fundamental chemical principles introduced during Years 1 and 2. The breadth of material covered is diverse and encompasses research-informed topics at the forefront of the discipline in areas such as analytical chemistry, medicinal and biological chemistry, green chemistry and many others.

Compulsory modules	Module Code	Credits	Period
Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms	CHE-30038	15	Semester 1
Advanced Organic Chemistry	CHE-30039	15	Semester 1
Advanced Physical and Inorganic Chemistry	CHE-30056	15	Semester 1
Chemistry/Medicinal Chemistry Research Project	CHE-30050	15	Semester 1-2
Chemistry/Medicinal Chemistry Dissertation	CHE-30051	15	Semester 1-2
Advanced Chemical Analysis	CHE-30032	15	Semester 2

Optional modules	Module Code	Credits	Period
Materials Chemistry and Catalysis	CHE-30043	15	Semester 1
Mechanisms of Drug Action	CHE-30058	15	Semester 1
Topics in Chemistry	CHE-30037	15	Semester 2
Topics in Medicinal Chemistry	CHE-30044	15	Semester 2

Level 6 Module Rules

- Students must pick one optional module from Semester 1 and one optional module from Semester 2.
- CHE-30047: Pre-requisite of Medicinal & Biological Chemistry 1 (CHE-20027).

Learning Outcomes

The table below sets out what students learn in the programme and the modules in which that learning takes place. Details of how learning outcomes are assessed through these modules can be found in module specifications.

Level 4

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
Knowledge of the major aspects of chemical terminology and vocabulary	Environmental and Sustainable Chemistry - CHE-10065 Practical and Professional Chemistry Skills - CHE-10061 Chemical Structure and Reactivity - CHE-10063
Knowledge and understanding of fundamental physicochemical principles.	Chemical Structure and Reactivity - CHE-10063 Practical and Professional Chemistry Skills - CHE-10061
Knowledge of a range of inorganic and organic materials	Practical and Professional Chemistry Skills - CHE-10061 Chemical Structure and Reactivity - CHE-10063
Understanding of general synthetic pathways, including related isolation, purification and characterisation techniques.	Chemical Structure and Reactivity - CHE-10063 Practical and Professional Chemistry Skills - CHE-10061
Awareness of issues within chemistry that overlap with other related disciplines.	Environmental and Sustainable Chemistry - CHE-10065 Chemical Structure and Reactivity - CHE-10063
Knowledge of selected aspects of chemistry at the forefront of the discipline.	Environmental and Sustainable Chemistry - CHE-10065
Knowledge of aspects of chemical science research methods and peer-reviewed chemical science literature.	Environmental and Sustainable Chemistry - CHE-10065

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
Demonstrate skills in the safe- handling of chemical materials, taking into account their physical and chemical properties including any specific hazards associated with their use	Practical and Professional Chemistry Skills - CHE-10061
Conduct risk assessments	Practical and Professional Chemistry Skills - CHE-10061
Conduct documented laboratory procedures in synthetic and analytical work, in relation to both inorganic and organic systems	Practical and Professional Chemistry Skills - CHE-10061
Monitor, by observation and measurement, chemical properties, events or changes, with systematic and reliable recording and documentation thereof	Practical and Professional Chemistry Skills - CHE-10061
Operate standard chemical instrumentation	Practical and Professional Chemistry Skills - CHE-10061
Interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory	Practical and Professional Chemistry Skills - CHE-10061
Demonstrate knowledge and understanding of essential chemistry-related facts, concepts, principles and theories	Environmental and Sustainable Chemistry - CHE-10065 Chemical Structure and Reactivity - CHE-10063 Practical and Professional Chemistry Skills - CHE-10061
Apply such knowledge and understanding to the solution of qualitative and quantitative problems, both familiar and unfamiliar	Practical and Professional Chemistry Skills - CHE-10061 Environmental and Sustainable Chemistry - CHE-10065 Chemical Structure and Reactivity - CHE-10063
Evaluate, interpret and synthesise chemical information and data	Chemical Structure and Reactivity - CHE-10063 Environmental and Sustainable Chemistry - CHE-10065 Practical and Professional Chemistry Skills - CHE-10061
Carry out practical application of theory using computer software and models	Practical and Professional Chemistry Skills - CHE-10061
Use information technology (IT) to manipulate and present chemical information and data	Chemical Structure and Reactivity - CHE-10063 Environmental and Sustainable Chemistry - CHE-10065 Practical and Professional Chemistry Skills - CHE-10061

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
Recognise and analyse problems and plan strategies for their solution.	Practical and Professional Chemistry Skills - CHE-10061
Communicate scientific material and arguments.	Practical and Professional Chemistry Skills - CHE-10061 Environmental and Sustainable Chemistry - CHE-10065 Chemical Structure and Reactivity - CHE-10063
Communicate information, ideas, problems, and solutions to both specialist and non- specialist audiences orally and in writing	Chemical Structure and Reactivity - CHE-10063 Environmental and Sustainable Chemistry - CHE-10065 Practical and Professional Chemistry Skills - CHE-10061
Demonstrate problem-solving skills, relating to qualitative and quantitative information	Practical and Professional Chemistry Skills - CHE-10061
Demonstrate numeracy and mathematical skills, including such aspects as error analysis, order-of- magnitude estimations, correct use of units and modes of data presentation	Environmental and Sustainable Chemistry - CHE-10065 Chemical Structure and Reactivity - CHE-10063 Practical and Professional Chemistry Skills - CHE-10061
Retrieve and cite information, in relation to primary and secondary information sources, including retrieval of information through online computer searches	Practical and Professional Chemistry Skills - CHE-10061 Chemical Structure and Reactivity - CHE-10063 Environmental and Sustainable Chemistry - CHE-10065
Demonstrate skills in the use of information technology for presenting information and data	Chemical Structure and Reactivity - CHE-10063 Environmental and Sustainable Chemistry - CHE-10065 Practical and Professional Chemistry Skills - CHE-10061
Interact with other people and engage in team-working, time management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working	Environmental and Sustainable Chemistry - CHE-10065 Practical and Professional Chemistry Skills - CHE-10061 Chemical Structure and Reactivity - CHE-10063

Level 5

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
Knowledge of the major aspects of chemical terminology and vocabulary	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Knowledge and understanding of fundamental physicochemical principles	Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059 Spectroscopy and Analysis - CHE-20057
Knowledge of a range of inorganic and organic materials	Spectroscopy and Analysis - CHE-20057 Physical and Structural Chemistry - CHE-20059 Molecular Chemistry and Reactions - CHE-20055
Understanding of general synthetic pathways, including related isolation, purification and characterisation techniques	Molecular Chemistry and Reactions - CHE-20055 Spectroscopy and Analysis - CHE-20057
Awareness of issues within chemistry that overlap with other related disciplines	Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081
Knowledge of selected aspects of chemistry at the forefront of the discipline	Principles of Drug Design - CHE-20081 Industrial Chemistry - CHE-20037 Molecular Chemistry and Reactions - CHE-20055
Knowledge of aspects of chemical science research methods and peer-reviewed chemical science literature	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Physical and Structural Chemistry - CHE-20059 Molecular Chemistry and Reactions - CHE-20055 Principles of Drug Design - CHE-20081

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
Demonstrate skills in the safe- handling of chemical materials, taking into account their physical and chemical properties including any specific hazards associated with their use	Principles of Drug Design - CHE-20081 Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Physical and Structural Chemistry - CHE-20059 Molecular Chemistry and Reactions - CHE-20055
Conduct risk assessments	Spectroscopy and Analysis - CHE-20057 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Conduct documented laboratory procedures in synthetic and analytical work, in relation to both inorganic and organic systems	Spectroscopy and Analysis - CHE-20057 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Monitor, by observation and measurement, chemical properties, events or changes, with systematic and reliable recording and documentation thereof	Spectroscopy and Analysis - CHE-20057 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Operate standard chemical instrumentation	Spectroscopy and Analysis - CHE-20057 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory	Spectroscopy and Analysis - CHE-20057 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Demonstrate knowledge and understanding of essential chemistry-related facts, concepts, principles and theories	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Apply such knowledge and understanding to the solution of qualitative and quantitative problems, both familiar and unfamiliar	Spectroscopy and Analysis - CHE-20057 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Evaluate, interpret and synthesise chemical information and data	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Carry out practical application of theory using computer software and models	Spectroscopy and Analysis - CHE-20057 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Use information technology (IT) to manipulate and present chemical information and data	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
Recognise and analyse problems and plan strategies for their solution	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Communicate scientific material and arguments	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Communicate information, ideas, problems, and solutions to both specialist and non- specialist audiences orally and in writing	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Demonstrate problem- solving skills, relating to qualitative and quantitative information	Spectroscopy and Analysis - CHE-20057 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Demonstrate numeracy and mathematical skills, including such aspects as error analysis, order-of- magnitude estimations, correct use of units and modes of data presentation	Spectroscopy and Analysis - CHE-20057 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Retrieve and cite information, in relation to primary and secondary information sources, including retrieval of information through online computer searches	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Demonstrate skills in the use of information technology for presenting information and data	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Interact with other people and engage in team-working, time management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working	Spectroscopy and Analysis - CHE-20057 Industrial Chemistry - CHE-20037 Principles of Drug Design - CHE-20081 Molecular Chemistry and Reactions - CHE-20055 Physical and Structural Chemistry - CHE-20059
Show development of skills and awareness necessary to seek out opportunities to undertake appropriate further training of a professional nature;	Spectroscopy and Analysis - CHE-20057

Level 6

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
Knowledge of the major aspects of chemical terminology and vocabulary	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Mechanisms of Drug Action - CHE-30058 Advanced Chemical Analysis - CHE-30032 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Advanced Physical and Inorganic Chemistry - CHE-30056 Advanced Organic Chemistry - CHE-30039
Knowledge and understanding of fundamental physicochemical principles	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Advanced Organic Chemistry - CHE-30039 Advanced Chemical Analysis - CHE-30032 Materials Chemistry and Catalysis - CHE-30043
Knowledge of a range of inorganic and organic materials	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Advanced Physical and Inorganic Chemistry - CHE-30056 Advanced Chemical Analysis - CHE-30032 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Advanced Organic Chemistry - CHE-30039
Understanding of general synthetic pathways, including related isolation, purification and characterisation techniques	Advanced Organic Chemistry - CHE-30039 Topics in Medicinal Chemistry - CHE-30044
Awareness of issues within chemistry that overlap with other related disciplines	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Mechanisms of Drug Action - CHE-30058 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Advanced Physical and Inorganic Chemistry - CHE-30056 Advanced Chemical Analysis - CHE-30032
Knowledge of selected aspects of chemistry at the forefront of the discipline	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Mechanisms of Drug Action - CHE-30058 Advanced Chemical Analysis - CHE-30032 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Advanced Physical and Inorganic Chemistry - CHE-30056 Advanced Organic Chemistry - CHE-30039
Knowledge of aspects of chemical science research methods and peer-reviewed chemical science literature	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Chemical Analysis - CHE-30032 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Advanced Organic Chemistry - CHE-30039
The ability to adapt and apply methodology to the solution of unfamiliar problems	Chemistry/Medicinal Chemistry Research Project - CHE-30050
The ability to design and plan experiments through selection of appropriate techniques and procedures, and to evaluate critically the outcomes of those experiments	Chemistry/Medicinal Chemistry Research Project - CHE-30050

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
Demonstrate skills in the safe- handling of chemical materials, taking into account their physical and chemical properties including any specific hazards associated with their use	Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Chemical Analysis - CHE-30032
Conduct risk assessments	Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Chemical Analysis - CHE-30032
Conduct documented laboratory procedures in synthetic and analytical work, in relation to both inorganic and organic systems	Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Chemical Analysis - CHE-30032
Monitor, by observation and measurement, chemical properties, events or changes, with systematic and reliable recording and documentation thereof	Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Chemical Analysis - CHE-30032
Operate standard chemical instrumentation	Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Chemical Analysis - CHE-30032
Interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory	Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Chemical Analysis - CHE-30032
Demonstrate knowledge and understanding of essential chemistry-related facts, concepts, principles and theories	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Advanced Organic Chemistry - CHE-30039 Advanced Chemical Analysis - CHE-30032 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Advanced Physical and Inorganic Chemistry - CHE-30056 Mechanisms of Drug Action - CHE-30058
Apply such knowledge and understanding to the solution of qualitative and quantitative problems, both familiar and unfamiliar	Topics in Medicinal Chemistry - CHE-30044 Topics in Chemistry - CHE-30037 Materials Chemistry and Catalysis - CHE-30043 Advanced Organic Chemistry - CHE-30039 Advanced Chemical Analysis - CHE-30032 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Advanced Physical and Inorganic Chemistry - CHE-30056 Mechanisms of Drug Action - CHE-30058
Evaluate, interpret and synthesise chemical information and data	Mechanisms of Drug Action - CHE-30058 Topics in Chemistry - CHE-30037 Advanced Physical and Inorganic Chemistry - CHE-30056 Chemistry/Medicinal Chemistry Research Project - CHE-30050 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Advanced Organic Chemistry - CHE-30039 Advanced Chemical Analysis - CHE-30032 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038
Carry out practical application of theory using computer software and models	Advanced Physical and Inorganic Chemistry - CHE-30056 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Chemistry/Medicinal Chemistry Research Project - CHE-30050
Use information technology (IT) to manipulate and present chemical information and data	Advanced Physical and Inorganic Chemistry - CHE-30056 Chemistry/Medicinal Chemistry Research Project - CHE-30050 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Advanced Chemical Analysis - CHE-30032 Advanced Organic Chemistry - CHE-30039 Materials Chemistry and Catalysis - CHE-30043 Topics in Medicinal Chemistry - CHE-30044 Topics in Chemistry - CHE-30037 Mechanisms of Drug Action - CHE-30058

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
Recognise and analyse problems and plan strategies for their solution	Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Chemistry/Medicinal Chemistry Research Project - CHE-30050 Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Advanced Organic Chemistry - CHE-30039 Advanced Chemical Analysis - CHE-30032
Communicate scientific material and arguments	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Advanced Organic Chemistry - CHE-30039 Mechanisms of Drug Action - CHE-30058 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Physical and Inorganic Chemistry - CHE-30056 Advanced Chemical Analysis - CHE-30032
Communicate information, ideas, problems, and solutions to both specialist and non- specialist audiences orally and in writing	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Advanced Organic Chemistry - CHE-30039 Mechanisms of Drug Action - CHE-30058 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Physical and Inorganic Chemistry - CHE-30056 Advanced Chemical Analysis - CHE-30032
Demonstrate problem-solving skills, relating to qualitative and quantitative information	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Chemical Analysis - CHE-30032 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Advanced Organic Chemistry - CHE-30039
Demonstrate numeracy and mathematical skills, including such aspects as error analysis, order-of- magnitude estimations, correct use of units and modes of data presentation	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Advanced Physical and Inorganic Chemistry - CHE-30056 Advanced Chemical Analysis - CHE-30032 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Organic Chemistry - CHE-30039
Retrieve and cite information, in relation to primary and secondary information sources, including retrieval of information through online computer searches	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Mechanisms of Drug Action - CHE-30058 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038 Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Physical and Inorganic Chemistry - CHE-30056 Advanced Organic Chemistry - CHE-30039

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
Demonstrate skills in the use of information technology for presenting information and data	Topics in Chemistry - CHE-30037 Topics in Medicinal Chemistry - CHE-30044 Materials Chemistry and Catalysis - CHE-30043 Mechanisms of Drug Action - CHE-30058 Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Physical and Inorganic Chemistry - CHE-30056 Chemical Kinetics, Photochemistry and Inorganic Reaction Mechanisms - CHE-30038
Interact with other people and engage in team-working, time management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working	Chemistry/Medicinal Chemistry Research Project - CHE-30050 Advanced Chemical Analysis - CHE-30032 Materials Chemistry and Catalysis - CHE-30043 Topics in Medicinal Chemistry - CHE-30044 Mechanisms of Drug Action - CHE-30058
Show development of skills and awareness necessary to seek out opportunities to undertake appropriate further training of a professional nature	Chemistry/Medicinal Chemistry Research Project - CHE-30050
Demonstrate self- direction, initiative and originality when solving problems	Chemistry/Medicinal Chemistry Research Project - CHE-30050

9. Final and intermediate awards

Credits required for each level of academic award are as follows:

Honours Degree	360 credits	You will require at least 120 credits at levels 4, 5 and 6 You must accumulate at least 270 credits in your main subject (out of 360 credits overall), with at least 90 credits in each of the three years of study*, to graduate with a named single honours degree in this subject. *An exemption applies for students transferring from a Combined Honours programme - see point 3.4 here: https://www.keele.ac.uk/regulations/regulationc3/
Diploma in Higher Education	240 credits	You will require at least 120 credits at level 4 or higher and at least 120 credits at level 5 or higher
Certificate in Higher Education	120 credits	You will require at least 120 credits at level 4 or higher

International Year option: in addition to the above students must pass a module covering the international year in order to graduate with a named degree including the 'international year' wording. Students who do not complete, or fail the international year, will be transferred to the three-year version of the programme.

Industrial Placement Year option: in addition to the above students must pass a non-credit bearing module covering the industrial placement year in order to graduate with a named degree including the 'with Industrial Placement Year' wording. Students who do not complete, or fail the industrial placement year, will be transferred to the three-year version of the programme.

10. How is the Programme Assessed?

The wide variety of assessment methods used on this programme at Keele reflects the broad range of knowledge and skills that are developed as you progress through the degree programme. Teaching staff pay particular attention to specifying clear assessment criteria and providing timely, regular and constructive feedback that helps to clarify things you did not understand and helps you to improve your performance. The following list is representative of the variety of assessment methods used on your programme:

- **Unseen written examinations** test students' knowledge and understanding of the subject. Examinations may consist of long or short answer questions
- **Pre-laboratory exercises** structured exercises designed to increase students understanding of the theory and techniques

required by a specific laboratory practical and may require the student to read the lab script, watch short videos of techniques, perform calculations, answer short questions and look up information

- **Laboratory reports** are structured proformas and full lab reports are formal summaries of work carried out in the laboratory and test students' understanding of the practical aspects of the programme and develop the skills necessary to enable students to present and analyse their results.
- **Laboratory diaries** are a hand-written record of work carried out in laboratory sessions, maintained regularly and kept in accordance with laboratory diary checklists and guidelines provided in the laboratory script. Typically, a selection of experiments carried out in each module will be assessed at the end of the semester
- **Practical examinations** are a series of laboratory or computer based exercises designed to directly assess a student ability to perform a specific procedure or type of data analysis
- **Oral examinations** students answer questions posed by members of staff on a specific topic such as a laboratory experiment, item of coursework, or a research project
- **IT assignments and computer-based exercises (e.g. spreadsheets exercises)** - various activities designed to assess students' ability to use software to retrieve, analyse and present scientific data in a variety of formats
- **Class tests** taken either conventionally or online via the Keele Learning Environment (KLE) assess students' subject knowledge and their ability to apply it in a more structured and focused way
- **Information retrieval exercises** require students to locate and analyse information of different types from the internet, various databases, scientific publications and textbooks. The information is then presented in a prescribed written format
- **Research projects and reports** test student's knowledge of different research methodologies and the limits and provisional nature of knowledge. They also enable students to demonstrate their ability to formulate research questions and to answer them using appropriate methods
- **Research proposals** require students to develop an independent research project and think through theoretical problems surrounding methodology and practical concerns relating to, for example, availability of sample, financial restrictions, and time limits. This form of assessment is key to the development of independent research skills and a portfolio of employability skills
- **Oral and poster presentations and reports** assess individual students' subject knowledge and understanding. They also test their ability to work effectively as members of a team, to communicate what they know orally and visually, and to reflect on these processes as part of their own personal development
- **Video/screencast presentations** require students to produce a short video or screencast on a given topic and assess students' knowledge and understanding, and ability to communicate what they know orally and visually, and to reflect on these processes as part of their own personal development
- **Problem sheets** students submit written answers to short problems testing their ability to apply chemical theories, interpret chemical data and solve mathematical problems
- **Design exercises** allow students to combine their chemical knowledge and data analysis skills with creativity to design drug molecules and synthetic routes to complex molecules

Marks are awarded for summative assessments designed to assess your achievement of learning outcomes. You will also be assessed formatively to enable you to monitor your own progress and to assist staff in identifying and addressing any specific learning needs. Feedback, including guidance on how you can improve the quality of your work, is also provided on all summative assessments within three working weeks of submission, unless there are compelling circumstances that make this impossible, and more informally in the course of tutorial and seminar discussions.

11. Contact Time and Expected Workload

This contact time measure is intended to provide you with an indication of the type of activity you are likely to undertake during this programme. The data is compiled based on module choices and learning patterns of students on similar programmes in previous years. Every effort is made to ensure this data is a realistic representation of what you are likely to experience, but changes to programmes, teaching methods and assessment methods mean this data is representative and not specific.

Undergraduate courses at Keele contain an element of module choice; therefore, individual students will experience a different mix of contact time and assessment types dependent upon their own individual choice of modules. The figures below are an example of activities that a student may expect on your chosen course by year stage of study. Contact time includes scheduled activities such as: lecture, seminar, tutorial, project supervision, demonstration, practical classes and labs, supervised time in labs/workshop, fieldwork and external visits. The figures are based on 1,200 hours of student effort each year for full-time students.

Activity

	Scheduled learning and teaching activities	Guided independent Study	Placements
Year 1 (Level 4)	27%	73%	0%
Year 2 (Level 5)	34%	66%	0%
Year 3 (Level 6)	17%	83%	0%

12. Accreditation

All BSc (Hons) Chemistry single honours degrees, including the 'with International Year' and 'with Industrial Placement Year' options, are fully accredited by the Royal Society of Chemistry.

13. University Regulations

The University Regulations form the framework for learning, teaching and assessment and other aspects of the student experience. Further information about the University Regulations can be found at: http://www.keele.ac.uk/student-agreement/

If this programme has any exemptions, variations or additions to the University Regulations these will be detailed in an Annex at the end of this document titled 'Programme-specific regulations'.

14. What are the typical admission requirements for the Programme?

See the relevant course page on the website for the admission requirements relevant to this programme: https://www.keele.ac.uk/study/

Applicants who are not currently undertaking any formal study or who have been out of formal education for more than 3 years and are not qualified to A-level or BTEC standard may be offered entry to the University's Foundation Year Programme.

Applicants for whom English is not a first language must provide evidence of a recognised qualification in English language. The minimum score for entry to the Programme is Academic IELTS 6.0 or equivalent.

Please note: All non-native English speaking students are required to undertake a diagnostic English language assessment on arrival at Keele, to determine whether English language support may help them succeed with their studies. An English language module may be compulsory for some students during their first year at Keele.

Recognition of Prior Learning (RPL) is considered on a case-by-case basis and those interested should contact the Programme Director. The University's guidelines on this can be found here: http://www.keele.ac.uk/qa/accreditationofpriorlearning/

15. How are students supported on the programme?

Personal Tutors: You are allocated a Personal Tutor for the duration of your studies as part of the University's Personal Tutor system and in accordance with the University Code of Practice on Personal Tutoring. The role of the Personal Tutor is to meet formally with you periodically to discuss your progress and performance and to offer support and advice. You can make arrangements to see their Personal/Subject Tutor at any time.

Year Tutors: A year tutor is allocated to your class for every year of study and is responsible for monitoring attendance, discussing academic progress and assisting with exceptional circumstances and other issues that may be affecting your performance.

Use of e-learning/the Keele Learning Environment (KLE): All modules belonging to the Chemistry programmes are supported by learning resources that are accessible to students via the KLE.

Health and Safety: All students admitted to the programme receive detailed training on health and safety in the laboratory and are provided with a Safety Handbook, Safety Glasses and a Laboratory Coat. Other personal protective equipment will be provided if required.

Students with disabilities, medical conditions or dyslexia: Students admitted to the Chemistry degree programme with disabilities or medical problems are asked to disclose their condition to Student Services. Year tutors and module leaders are responsible for ensuring reasonable adjustments are made.

Support for Students during International Year: Our study abroad tutor will maintain regular contact with students studying abroad. This will include a minimum of monthly emails to check on your progress and bimonthly Skype conversations.

Support for Students during Placement Year: Our careers tutor will maintain regular contact with students on placement. This will include a minimum of monthly emails to check on your progress, bimonthly Skype conversations, and a visit by a member of Keele staff to your host company.

16. Learning Resources

Chemistry at Keele is based in the Lennard-Jones building and Central Science Laboratories (CSL), which house excellent, modern, well-equipped teaching and research laboratory facilities. Each module has a site within the university's virtual learning environment (the Keele Learning Environment or KLE), which hosts teaching materials (lecture notes/slides, laboratory scripts, assessments, past examination papers, on-line quizzes, videos, screencasts and audio clips) and useful links. The KLE is accessible on or off campus and is also used for online submission and return of assessments. Each module has a module guide or specification which contains details of the specific intended learning outcomes, Graduate Attributes and assessments.

17. Other Learning Opportunities

Study Abroad (International Year)

A summary of the International Year, which is a potential option for students after completion of year 2 (Level 5), is provided in the Annex for the International Year.

If you are interested in spending a year studying abroad, then our Study Abroad Tutor will advise and support you in applying.

Industrial Placement Year

A summary of the Industrial Placement Year, which is a potential option for students after completion of year 2 (Level 5), is provided in the Annex for the Industrial Placement Year.

If you are interested in spending a year in industry on a placement, then our Careers Tutor will advise and support you in applying for suitable placements.

18. Additional Costs

As to be expected there will be additional costs for inter-library loans and potential overdue library fines, print and graduation. We do not anticipate any further costs for this programme.

19. Quality management and enhancement

The quality and standards of learning in this programme are subject to a continuous process of monitoring, review and enhancement.

- The School Education Committee is responsible for reviewing and monitoring quality management and enhancement procedures and activities across the School.
- Individual modules and the programme as a whole are reviewed and enhanced every year in the annual programme review which takes place at the end of the academic year.
- The programmes are run in accordance with the University's Quality Assurance procedures and are subject to periodic reviews under the Internal Quality Audit (IQA) process.

Student evaluation of, and feedback on, the quality of learning on every module takes place every year using a variety of different methods:

- The results of student evaluations of all modules are reported to module leaders and reviewed by the Programme Committee as part of annual programme review.
- Findings related to the programme from the annual National Student Survey (NSS), and from regular surveys of the student experience conducted by the University, are subjected to careful analysis and a planned response at programme and School level.
- Feedback received from representatives of students in all three years of the programme is considered and acted on at regular meetings of the Student Staff Voice Committee.

The University appoints senior members of academic staff from other universities to act as external examiners on all programmes. They are responsible for:

- Approving examination questions
- Confirming all marks which contribute to a student's degree
- Reviewing and giving advice on the structure and content of the programme and assessment procedures

Information about current external examiner(s) can be found here:
http://www.keele.ac.uk/qa/externalexaminers/currentexternalexaminers/

20. The principles of programme design

The programme described in this document has been drawn up with reference to, and in accordance with the guidance set out in, the following documents:

a. UK Quality Code for Higher Education, Quality Assurance Agency for Higher Education: http://www.qaa.ac.uk/quality-code
b. QAA Subject Benchmark Statement: Chemistry (2014) http://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-chemistry-14.pdf?sfvrsn=99e1f781_10
c. Keele University Regulations and Guidance for Students and Staff: http://www.keele.ac.uk/regulations
d. BSc Degree Accreditation (2019): https://www.rsc.org/Education/courses-and-careers/accredited-courses/bsc-accreditation.asp

21. Annex - International Year

BSc Chemistry with International Year

International Year Programme

Students registered for this Single Honours programme may either be admitted for or apply to transfer during their period of study at Level 5 to the International Year option. Students accepted onto this option will have an extra year of study (the International Year) at an international partner institution after they have completed Year 2 (Level 5) at Keele.

Students who successfully complete both the second year (Level 5) and the International Year will be permitted to progress to Level 6. Students who fail to satisfy the examiners in respect of the International Year will normally revert to the standard programme and progress to Level 6 on that basis. The failure will be recorded on the student's final transcript.

Study at Level 4, Level 5 and Level 6 will be as per the main body of this document. The additional detail contained in this annex will pertain solely to students registered for the International Year option.

International Year Programme Aims

In addition to the programme aims specified in the main body of this document, the international year programme of study aims to provide students with:

1. Personal development as a student and a researcher with an appreciation of the international dimension of their subject
2. Experience of a different culture, academically, professionally and socially

Entry Requirements for the International Year

Students may apply to the 4-year programme during Level 5. Admission to the International Year is subject to successful application, interview and references from appropriate staff.

The criteria to be applied are:

- Academic Performance (an average of 60% across all modules in Semester 1 at Level 5 is normally required. Places on the International Year are then conditional on achieving an average mark of 54% across all Level 5 modules with no module fails. Where no Semester 1 marks have been awarded performance in 1st year marks and ongoing 2nd year assessments are taken into account)
- General Aptitude (to be demonstrated by application for study abroad, interview during the 2nd semester of year 2 (Level 5), and by recommendation of the student's personal tutor, 1st and 2nd year tutors and programme director)

Students may not register for both an International Year and a Placement Year.

Student Support

Students will be supported whilst on the International Year via the following methods:

- Phone or Skype conversations with Study Abroad tutor, in line with recommended Personal Tutoring meeting points.
- Support from the University's Global Education Team

Learning Outcomes

In addition to the learning outcomes specified in the main text of the Programme Specification, students who complete a Keele undergraduate programme with International Year will be able to:

1. Describe, discuss and reflect upon the cultural and international differences and similarities of different learning environments
2. Discuss the benefits and challenges of global citizenship and internationalisation
3. Explain how their perspective on their academic discipline has been influenced by locating it within an international setting.
4. Describe, discuss and reflect upon the cultural and international differences and similarities of different learning environments
5. Discuss the benefits and challenges of global citizenship and internationalisation
6. Explain how their perspective on their academic discipline has been influenced by locating it within an international setting
7. Design, plan and critically evaluate practical investigation, record relevant information accurately and systematically and be able to reflect upon the data in critical manner
8. Develop, synthesize and apply fundamental principles and solve specific problems in the context of chemistry.

These learning outcomes will all be assessed by the submission of a satisfactory individual learning agreement, the successful completion of assessments at the partner institution and the submission of the reflective portfolio element of the international year module.

Regulations

Students registered for the International Year are subject to the programme-specific regulations (if any) and the University regulations. In addition, during the International Year, the following regulations will apply:

Students undertaking the International Year must complete 120 credits, which must comprise *at least 40%* in the student's discipline area.

This may impact on your choice of modules to study, for example you will have to choose certain modules to ensure you have the discipline specific credits required.

Students are barred from studying any module with significant overlap to the Level 6 modules they will study on their return. Significant overlap with Level 5 modules previously studied should also be avoided.

Additional costs for the International Year

Tuition fees for students on the International Year will be charged at 15% of the annual tuition fees for that year of study, as set out in Section 1. The International Year can be included in your Student Finance allocation, to find out more about your personal eligibility see: www.gov.uk

Students will have to bear the costs of travelling to and from their destination university, accommodation, food and personal costs. Depending on the destination they are studying at additional costs may include visas, study permits, residence permits, and compulsory health checks. Students should expect the total costs of studying abroad be greater than if they study in the UK, information is made available from the Global Education Team throughout the process, as costs will vary depending on destination.

Students studying in Erasmus+ destinations may be eligible for grants as part of this programme. Students studying outside of this programme may be eligible income dependent bursaries at Keele.

Students travel on a comprehensive Keele University insurance plan, for which there are currently no additional charges. Some Governments and/or universities require additional compulsory health coverage plans; costs for this will be advised during the application process.

22. Annex - Industrial Placement Year

BSc Chemistry with Industrial Placement Year

Industrial Placement Year summary

Students registered for this programme may either be admitted for or apply to transfer during their studies to the 'with Industrial Placement Year' option (NB: for Combined Honours students the rules relating to the industrial placement year in the subject where the placement is organised are to be followed). Students accepted onto this programme will have an extra year of study (the Industrial Placement Year) with a relevant placement provider after they have completed Year 2 (Level 5) at Keele.

Students who successfully complete both the second year (Level 5) and the Industrial Placement Year will be permitted to progress to Level 6. Students who fail to satisfactorily complete the Industrial Placement Year will normally revert to the 3-year programme and progress to Level 6 on that basis. The failure will be recorded on the student's final transcript.

Study at Level 4, Level 5 and Level 6 will be as per the main body of this document. The additional detail contained in this annex will pertain solely to students registered for the Industrial Placement Year option.

Industrial Placement Year Programme Aims

In addition to the programme aims specified in the main body of this document, the Industrial Placement Year aims to provide students with:

1. Personal development as a student, and a researcher, with an appreciation of the industrial and applied dimension of chemistry
2. Experience of work in an industrial setting with the associated academic, safety and professional requirements

Entry Requirements for the Industrial Placement Year

Admission to the Industrial Placement Year is subject to successful application, interview and references from appropriate staff. Students have the opportunity to apply directly for the 4-year 'with industrial placement year' degree programme, or to transfer onto the 4-year programme at the end of Year-1 and in Year-2 at the end of Semester 1. Students who are initially registered for the 4-year degree programme may transfer onto the 3-year degree programme at any point in time, prior to undertaking the year-long industrial placement. Students who fail to pass the industrial placement year, and those who fail to meet the minimum requirements of the industrial placement year module (minimum 30 weeks full time (1,050 hours), or equivalent, industrial placement), will be automatically transferred onto the 3-year degree programme.

The criteria to be applied are:

- A good University attendance record and be in 'good academic standing'.
- Passed all Year-1 and Year-2 Semester 1 modules with an overall module average of > 60%
- General Aptitude (to be demonstrated by application(s) to relevant placement providers with prior agreement from the Programme Lead, interview during the 2nd semester of year 2 (Level 5), and by recommendation of the student's personal tutor, 1st and 2nd year tutors and Programme Lead)
- Students undertaking industrial placements will be expected to complete a Health and Safety checklist prior to commencing their work experience and will be required to satisfy the Health and Safety regulations of the company or organisation at which they are based.
- *(International students only)* Due to visa requirements, it is not possible for international students who require a Tier 4 Visa to apply for direct entry onto the 4-year with Industrial Placement Year degree programme. Students wishing to transfer onto this programme should discuss this with student support, the academic tutor for the Industrial Placement Year, and the Programme Lead. Students should be aware that there are visa implications for this transfer, and it is the student's responsibility to complete any and all necessary processes to be eligible for this programme. There may be additional costs, including applying for a new Visa from outside of the UK for international students associated with a transfer to the industrial placement programme.

Students may not register for both an International Year and a Industrial Placement Year.

Student Support

Students will be supported whilst on the Industrial Placement Year via the following methods:

- Regular contact between the student and a named member of staff who will be assigned to the student as their University supervisor. The University supervisor will be in regular contact with the student throughout the year, and be on hand to provide advice (pastoral or academic) and liaise with the Placement supervisor on the student's behalf if required.
- Two formal contacts with the student during the placement year: the University supervisor will visit the student in their placement organization at around the 5 weeks afters placement has commenced, and then visit again (or conduct a telephone/video call tutorial) at around 15 weeks into the placement.
- Weekly supervision sessions will take place with the placement supervisor (or his/her nominee) throughout the duration of the placement.

Learning Outcomes

In addition to the learning outcomes specified in the main text of the Programme Specification, students who complete the 'with Industrial Placement Year' option will be able to:

1. Apply the chemical theories and laboratory skills learnt to real situations in the industrial workplace to design, plan, risk asses, and critically evaluate practical investigations
2. Develop key professional skills in the accurate documentation of information; the analysis of chemical data; and the planning and safe operation of chemical processes
3. Develop employability skills in the presentation and communication of data; the writing of reports; and the ability to work effectively, individually, and as part of a team
4. Explain how their perspective on chemistry has been influenced by working within an industrial setting

These learning outcomes will be assessed through the non-credit bearing Industrial Placement Year module (CHE-30054) which involves:

1. An oral presentation on the placement year
2. A placement portfolio containing a reflective diary on the students work and experience, an evaluation of the students' performance by the placement host, and a report on the work done.

Regulations

Students registered for the 'with Industrial Placement Year' option are subject to programme-specific regulations (if any) and the University regulations. In addition, during the Industrial Placement Year, the following regulations will apply:

- Students undertaking the Industrial Placement Year must successfully complete the zero-credit rated 'Industrial Placement Year' module (CHE-30054)
- In order to ensure a high quality placement experience, each placement agency will sign up to a placement contract (analogous to a service level agreement).
- Once a student has been accepted by a placement organisation, the student will make a pre-placement visit and a member of staff identified within the placement contract will be assigned as the placement supervisor. The placement supervisor will be responsible for ensuring that the placement experience meets the agreed contract agreed with the University.
- The placement student will also sign up an agreement outlining his/her responsibilities in relation to the requirements of each organisation.

Students will be expected to behave professionally in terms of:

(i) conforming to the work practices of the organisation; and

(ii) remembering that they are representatives of the University and their actions will reflect on the School and have an impact on that organisation's willingness (or otherwise) to remain engaged with the placement.

Additional costs for the Industrial Placement Year

Tuition fees for students on the Industrial Placement Year will be charged at 20% of the annual tuition fees for that year of study, as set out in Section 1. The Industrial Placement Year can be included in your Student Finance allocation; to find out more about your personal eligibility see: www.gov.uk

Students will have to bear the costs of travelling to and from their placement provider, accommodation, food and personal costs. Depending on the placement provider additional costs may include parking permits, travel and transport, suitable clothing, DBS checks, and compulsory health checks.

A small stipend may be available to students from the placement provider during the placement but this will need to be explored on a placement-by-placement basis as some organisations, such as charities, may not have any extra money available. Students should budget with the assumption that their placement will be unpaid.

Eligibility for student finance will depend on the type of placement and whether it is paid or not. If it is paid, this is likely to affect student finance eligibility, however if it is voluntary and therefore unpaid, should not affect student finance eligibility. Students are required to confirm eligibility with their student finance provider.

International students who require a Tier 4 visa should check with the Immigration Compliance team prior to commencing any type of paid placement to ensure that they are not contravening their visa requirements.

23. Annex - Programme-specific regulations

Programme Regulations: Chemistry

Final Award and Award Titles	BSc (Hons) Chemistry BSc (Hons) Chemistry with International Year BSc (Hons) Chemistry with Industrial Placement Year
Intermediate Award(s)	Diploma in Higher Education Certificate in Higher Education
Last modified	June 2019
Programme Specification	https://www.keele.ac.uk/qa/programmespecifications

The University's Academic Regulations which can be found on the Keele University website (https://www.keele.ac.uk/regulations/)[1] apply to and regulate the programme, other than in instances where the specific programme regulations listed below over-ride them. These programme regulations list:

- *Exemptions* which are characterised by the omission of the relevant regulation.
- *Variations* which are characterised by the replacement of part of the regulation with alternative wording.
- *Additional Requirements* which set out what additional rules that apply to students in relation to this programme.

The following **exemptions, variations** and **additional requirements** to the University regulations have been checked by Academic Services and have been approved by the Faculty Education Committee.

A) EXEMPTIONS

The clause(s) listed below describe where an exemption from the University's Academic Regulations exists:

For the whole duration of their studies, students on this Programme are exempt from the following regulations:

- **No exemptions apply.**

B) VARIATIONS

The clause(s) listed below describe where a variation from the University's Academic Regulations exists:

Variation 1: Self-Certification of Short Term Absence

To cover short term absences of up to 5-working days from compulsory sessions, students are permitted to submit three self-certifications (notification of short-term absence) per semester. Any such notifications must be made within 5-working days of the absence. Further absences beyond this may require evidence.

Variation 2: Coursework Assessment

Failure to engage appropriately with a module's coursework assessment items without good cause (that is, by failing to submit more than 50% of coursework items) may result in reassessment being denied.

Variation 3: Level 4 to Level 5 Progression

In order to progress from level 4 to level 5, students must pass all core chemistry modules and meet the required threshold qualifying marks on any assessment(s) in these modules. Students with outstanding reassessment attempts on assessments with threshold qualifying marks may not progress before these assessments have been completed. At the discretion of the Chemistry Board of Examiners, this may be discounted.

Additional Requirements

The programme requirements listed below are in addition to the University's Academic Regulations:

Additional requirement 1: Laboratory Classes

1. Laboratory classes are compulsory and are an essential part in fulfilling the intended learning outcomes of modules of which they are part, and a requirement of Royal Society of Chemistry accreditation. Failure to attend a significant number (> 50%) of the laboratory classes without good cause will result in failure of the module with no reassessment being offered.
2. Further to the provisions of regulations C3 and C6, any student failing to attend one laboratory class and unable to provide good cause for their absence in advance, or within 5 working days of their absence, will be issued with an informal academic warning. Thereafter warnings will be issued in line with School of Chemical and Physical Sciences policy. This is to ensure students understand the need to attend laboratory classes in order to fulfil the learning outcomes and to meet the requirements of accreditation.
3. Any student failing to follow the health and safety guidelines in the undergraduate laboratory will be asked to leave. This may include inappropriate dress, refusal to follow reasonable requests of staff, or attending under the influence of alcohol or other substances. The student will not be permitted to make up the missed session.
4. There is no opportunity to make up missed laboratory sessions due to timetable constraints and so the following concessions will be made available to the student:

- the student may be given opportunity to submit assessed work based on an alternative laboratory session, in agreement with the module leader and year tutor;

- with the approval of the Chemistry Board of Examiners, a small element of the laboratory assessment (up to 33%) may be disregarded with the final mark for the assessment being recalculated from the remaining elements.

Additional requirement 2: Other Compulsory Classes

Various compulsory classes (including workshops, assessment introductions, team-based learning sessions, tutorials, class tests and feedback sessions), at which attendance is compulsory, form an essential part of the chemistry/medicinal chemistry teaching programme. Failure to attend these sessions will result in warnings being issued in line with School of Chemical and Physical Sciences policy. In addition, failure to attend a significant number (>50%) of these sessions without good cause may result in reassessment being denied.

[1] References to University Regulations in this document apply to the content of the University's Regulatory Framework as set out on the University website here https://www.keele.ac.uk/regulations/.

Version History

This document

Date Approved: 23 March 2021

Previous documents

Version No	Year	Owner	Date Approved	Summary of and rationale for changes
1	2020/21	MIKE EDWARDS	12 December 2019	
1	2019/20	MIKE EDWARDS	12 December 2019	