

Programme Specification

MChem Chemistry with a One Year Placement: 2016/17

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 s/he takes full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of Study	Full-time
Duration in Years	4 years, following standard progression for a full-time student
Accreditation details	Royal Society of Chemistry (RSC) provide accreditation on graduation for membership and chartered status (MRSC, CChem)
Final award	Master of Chemistry
Name of award	Chemistry with Year-long Placement
Interim Exit awards	Bachelor of Science (Honours) Bachelor of Science (Ordinary) Diploma of Higher Education Certificate of Higher Education
FHEQ level of final award	7
UCAS code	F102
QAA Subject Benchmark or other external reference	QAA Subject Benchmark Statement for Chemistry (December 2014) QAA Master's degree characteristics (March 2010) QAA Framework for Higher Education Qualifications (FHEQ) Royal Society of Chemistry accreditation criteria (2012)
Programme Coordinator	Chemistry Director of Programmes
Date specification was written	6/9/2015
Date specification was validated	13/01/2016
Date specification was last updated	March 2016

Programme Overview

Brief outline of the programme

The MChem Chemistry degree aims to enhance your sense of enthusiasm for chemistry and to involve you in an intellectually stimulating experience of learning in a supportive environment. You will gain extensive in-depth knowledge and understanding of chemistry and related subjects, as well as a comprehensive training in practical chemistry and an appreciation of the importance of the discipline in different contexts. We will provide a sound basis for a successful career as a professional chemist and provide opportunities for you to develop a range of transferable skills for both chemical and non-chemical careers.

Integrated Masters students develop an in-depth knowledge and critical awareness of a substantial area of chemistry and are suitably prepared for employment in the chemical sciences or for studying further at doctoral level.

A key feature of the MChem Chemistry with one year placement programme is that you will complete both a research project based in Southampton and an industry or research-establishment based placement project. These projects that will help to equip you for a successful career as a professional chemist and enable you to fulfil the requirements of the Royal Society of Chemistry for the CChem qualification.

Learning and teaching

To assist your learning the academic staff will provide an extensive programme of lectures, tutorials, problem workshops, and laboratory classes. They will provide learning support material and also informal assistance to guide your private study.

Your placement project will be supervised by a line-manager or academic supervisor employed by the organisation where you take up your placement and supported by an member of staff from Southampton acting as an advisor. Additional assistance will be provided by our placements tutor.

You will be guided during the completion of your Southampton-based research project by a member of staff, with whom you will meet regularly to discuss the context, design, execution, interpretation, and presentation of your project work. Additional lectures that support your research training in aspects such as the assessment of risks and hazards, production of written reports, and oral presentations will be provided. Completion of the project will enable you to demonstrate your academic independence.

Assessment

There are written examinations at the end of each semester to test your knowledge and understanding of material presented in the lectures and workshops. The practical work is continuously assessed primarily through written reports. Project work is assessed by dissertation and oral examination together with a report on your relevant skills from your supervisor. A written literature review related to the project is also assessed.

Coursework exercises based on the lecture material are set each week and feedback is provided promptly. In some cases coursework marks are used in calculating your overall mark for the particular module of study. However in most cases coursework is simply to give you an indication of your progress.

The research project and placement project will be assessed via a variety of means including review of your laboratory notebook, your assessments of the risks and hazards of your work, written reports, oral presentations, the production of a dissertation, and an oral examination.

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration, however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our [Disclaimer](#) to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's programme validation process which is described in the University's Quality handbook.

Educational Aims of the Programme

The general aims of the Chemistry degree programmes are to:

- instil in you an enthusiasm for Chemistry and an appreciation of its application in different contexts;
- involve you in an intellectually stimulating and satisfying experience of learning and studying in a supportive environment;
- enable you to establish an appreciation of the importance and sustainability of the chemical sciences in an industrial, academic, economic, environmental and social context.
- develop a range of appropriate generic skills of value in chemical and non-chemical employment.

The main aims of the MChem degree are:

- provide you with a broad and balanced knowledge and understanding of key chemical concepts;
- develop your range of practical skills so that you can understand and assess risks and work safely and competently in the laboratory;
- develop your ability to apply standard methodology to the solution of problems in chemistry;
- provide you with a knowledge and skills base from which you can proceed to graduate employment or to further studies in chemistry or multi-disciplinary areas involving chemistry.
- to extend your comprehension of key chemical concepts and so provide you with an in-depth understanding of specialised areas of chemistry;
- to develop your ability to plan and carry out experiments independently as well as your ability to assess the outcomes and significance of such experiments;
- to develop your ability to adapt and apply methodologies to the solution of unfamiliar types of problems;
- to instil in you an awareness of advances at the forefront of the chemical sciences;
- to prepare you effectively for professional employment or research degrees in the chemical sciences.

Programme Learning Outcomes

Knowledge and Understanding

Having successfully completed this programme you will be able to demonstrate:

1. knowledge and broad understanding of major aspects of chemical terminology;
2. a systematic understanding of fundamental physicochemical principles, including thermodynamics, chemical kinetics, and quantum mechanics, and possess and ability to apply that knowledge to the solution of theoretical and practical problems;
3. knowledge of a range of inorganic, organic, and organometallic compounds and materials;
4. knowledge and understanding of the evidenced based synthesis of organic and inorganic compounds, including related isolation, purification, and characterisation techniques;
5. knowledge of the qualitative and quantitative aspects of chemical metrology and the importance of traceability;
6. an awareness of issues within chemistry that overlap with other related subjects;
7. an understanding of ethics, societal responsibilities, environmental impact and sustainability, in the context of chemistry;
8. an understanding of safe working practices, in terms of managing chemical toxicity, chemical stability and chemical reactivity, and the preparation of knowledge-based risk assessments;
9. an understanding of the key features of transition metal and f-block elements and their chemistries;
10. an understanding of the fundamentals of bio-organic chemistry;
11. an understanding of the fundamentals of catalysis, electrochemistry, and surface science;
12. an ability to understand and engage with scientific literature;
13. knowledge of a selection of topics currently at the frontiers of chemical research and some of the specialist techniques used to investigate them
14. an in-depth knowledge and critical awareness of a substantial area of chemistry.

Teaching and Learning Methods

Knowledge and understanding are developed through participation in lectures, workshop/problem classes, small group tutorials, laboratory and computer based practical classes, and through a supervised research project.

Assessment Methods

Testing of the knowledge base and understanding is through a combination of unseen written examinations which comprise questions that test recall of seen material, understanding and interpretation of unseen material, application of knowledge, and problem solving, assessed course work in the form of laboratory reports and other exercises, oral examinations and presentations, and an individual dissertation project report.

Subject Specific Intellectual and Research Skills

Having successfully completed this programme you will have developed:

15. the ability to demonstrate knowledge and understanding of essential chemical facts, concepts, principles and theories;
16. the ability to apply such knowledge and understanding to the solution of qualitative and quantitative problems that are mostly of a familiar nature;
17. the ability to recognise and analyse problems and plan strategies for their solution;
18. skills in the generation, evaluation, interpretation and synthesis of chemical information and data;
19. skills in the practical application of theory using computational methodology and models;
20. skills in communicating scientific material and arguments;

21. information technology and data-processing skills, relating to chemical information and data;
22. the ability to adapt and apply methodology to the solution of unfamiliar problems;
23. the ability to assimilate, evaluate, and present research results objectively;
24. skills required to undertake a research project reporting outcomes that are potentially publishable (in a peer-reviewed publication).

Teaching and Learning Methods

Intellectual skills are developed through the teaching and learning activities outlined above. IT, analysis, communication, and problem solving skills are developed extensively through the workshops, tutorials, practical classes and the research project. The use of databases is addressed in the practicals and in workshops and briefing lectures that are part of the research project module.

Assessment Methods

Subject specific intellectual and research skills are assessed via unseen written examinations, coursework, practical reports, oral examinations, and the project dissertation.

Subject Specific Practical Skills

Having successfully completed this programme you will have developed:

25. an ability to determine hazards associated with carrying out chemical experiments in terms of chemical toxicity, chemical stability and chemical reactivity and be able to find information to enable effective risk assessments to be carried out;
26. skills to handle chemicals safely and carry out experiments and chemical reactions in a safe manner, based on effective risk assessments;
27. skills required for the conduct of documented laboratory procedures involved in synthesis and analysis, in relation to both inorganic and organic systems;
28. skills in the monitoring, by observation and measurement, of chemical properties, events or changes, and the systematic and reliable recording and documentation thereof;
29. skills in the operation of standard chemical instrumentation;
30. the ability to plan experimental procedures, given well defined objectives;
31. the ability to interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory;
32. the ability to select appropriate techniques and procedures;
33. competence in the planning, design, and execution of experiments;
34. skills required to work independently and be self-critical in the evaluation of risks, experimental procedures, and outcomes;
35. the ability to use an understanding of the uncertainty of experimental data to inform the planning of future work.

Teaching and Learning Methods

Subject specific practical skills are developed through specific lectures as well as the completion of exercises that accompany the practical sessions and the research project.

Assessment Methods

Practical skills are assessed through pre-lab exercises, laboratory reports, coursework exercises, and the research project.

Transferable and Generic Skills (Graduate Attributes)

Graduate Attributes are the personal qualities, skills and understanding you can develop during your studies. They include but extend beyond your knowledge of an academic discipline and its technical proficiencies. Graduate Attributes are important because they equip you for the challenge of contributing to your chosen profession and may enable you to take a leading role in shaping the society in which you live.

We offer you the opportunity to develop these attributes through your successful engagement with the learning and teaching of your programme and your active participation in University life. The skills, knowledge and personal qualities that underpin the Graduate Attributes are supported by your discipline. As such, each attribute is enriched, made distinct and expressed through the variety of learning experiences you will experience. Your development of Graduate Attributes presumes basic competencies on entry to the University.

Having successfully completed this programme you will have developed:

36. communication skills, covering both written and oral communication with a variety of audiences;
37. skills in the employment of common conventions and standards in scientific writing, data presentation, and referencing literature;
38. problem-solving skills, relating to qualitative and quantitative information;
39. numeracy and mathematical skills, including handling data, algebra, functions, trigonometry, calculus, vectors and complex numbers, alongside error analysis, order-of-magnitude estimations, systematic use of scientific units and different types of data presentation,
40. information location and retrieval skills, in relation to primary and secondary information sources, and the ability to assess the quality of information accessed;
41. information technology skills which support the location, management, processing, analysis and presentation of scientific information;
42. basic interpersonal skills relating to the ability to interact with other people and to engage in team working;
43. time management and organisational skills, as evidence by the ability to plan and implement efficient and effective ways of working;
44. skills needed to undertake appropriate further training of a professional nature;
45. other relevant professional and employability skills such as business awareness and networking;
46. problem-solving skills including the demonstration of self-direction, initiative and originality;
47. the ability to communicate and interact with professionals from other subjects;
48. the ability to make decisions in complex and unpredictable situations;
49. the ability to think critically in the context of data analysis and experimental design;
50. the ability to work in multi-disciplinary and multi-skilled teams;
51. independent learning skills for continuing professional development.

Teaching and Learning Methods

Oral and written communication skills are developed through all the teaching and learning activities. Data presentation is specifically addressed in the practical classes and the research project. Numeracy and mathematical skills are developed through a series of support lectures and workshops in parts 1 and 2 of the degree. Information technology skills are developed throughout the programme, with specific emphasis during the practical sessions and the research project, via lectures and workshops. Interpersonal skills are enhanced via team working in the practical sessions and interaction with the research group and supervisor in the research project. Time management and organisational skills are developed through the setting and strict enforcement of deadlines. Skills that enable further professional development, employability, and networking are nurtured and developed throughout the programme and are supported by various extra timetabled sessions.

Assessment Methods

Communication, presentation, problem-solving, numeracy, information retrieval, and IT skills are assessed via unseen written examinations, coursework, and the project dissertation. Interpersonal skills are assessed as part of the supervisor's assessment for the project module and team working in the practical classes. Time management and organisation is assessed by applying penalties for failure to meet deadlines. Skills required to undertake further training, employability, and networking are essential for success on the programme and for future professional development, but are not formally assessed.

Programme Structure

Typical course content

The programme of study is divided into modules. Each module is assigned a number of credit points (ECTS = European Credit Transfer Scheme or CATS Credit Accumulation and Transfer Scheme) that relates to the hours of formal teaching plus the recommended time for private study (1 ECTS = 20 hours of notional study, 1 CATS = 10 hours of notional study). In each year you will take certain core and/or compulsory modules and a selection of approved option modules that make up an academic load of 60 ECTS/120 CATS. The modules are graded introductory/ fundamental, FHEQ Level 4 (1) intermediate, FHEQ Level 5 (2) advanced, FHEQ Level 6 (3), and Masters, FHEQ Level 7 (4): the number in brackets indicates the Year of Study in which the module is *normally* taken.

To help you see Chemistry in a broader context you will study at least 30 ECTS (60 CATS) of subjects that are academically and/or professionally related to Chemistry in the first two years. A feature of the programme is the wide range of modules available for this purpose.

In part 3 of this programme you will complete core modules accounting for 37.5 ECTS (75 CATS) including a research project and 22.5 ECTS (45 CATS) of option modules.

In part 4 of this programme you will complete 52.5 ECTS (105 CATS) of compulsory Chemistry consisting of a placement project accounting for 45 ECTS (90 CATS), a distance learning module accounting for 3.75 ECTS (7.5 CATS) and accounting for 3.75 ECTS (7.5 CATS) and a 7.5 ECTS (15 CATS) option module. We work closely with our collaborators in the external placement scheme to ensure that the same standards of safety, supervision and learning opportunities offered in Southampton are available to all our students. For those who do not succeed in finding a placement there is the possibility to transfer to the MChem Chemistry (F103) degree completed in Southampton.

Detailed module descriptions including the breakdown of coursework and examination elements for each module are available online at <http://www.southampton.ac.uk/chemistry/undergraduate/modules.page>

MChem with a One Year Placement Programme Details

Details of the Programme Structure may be found on the Academic Unit web site, http://www.southampton.ac.uk/chemistry/undergraduate/courses/f102_mchem_with_year.page? (where an indicative list of options can be found. We cannot guarantee to offer every option each year); in the Year Handbooks, <http://www.southampton.ac.uk/student-services/academic-life/faculty-handbooks.page> and are briefly summarised below.

In each year you will take courses that make up an academic load of 60 ECTS.

Part 1 (FHEQ Level 4)

This consists of 45 ECTS of core chemistry plus 15 ECTS of subsidiary/optional modules. If successfully completed, students can progress to Part 2 (FHEQ Level 5) or leave with the Level 4 intermediate exit award, a Certificate of Higher Education.

Chemistry Core Modules (Total 45 ECTS)

CHEM1031	Fundamentals of Organic Chemistry I
CHEM1032	Fundamentals of Organic Chemistry II
CHEM1033	Fundamentals of Physical Chemistry I
CHEM1034	Fundamentals of Physical Chemistry II
CHEM1035	Fundamentals of Inorganic Chemistry I
CHEM1036	Fundamentals of Inorganic Chemistry II

Part 2 (FHEQ Level 5)

This consists of 45 ECTS of core chemistry plus 15 ECTS of subsidiary/optional modules. If successfully completed, students can progress to Part 3 (FHEQ Level 6) or leave with the Level 5 intermediate exit award, a Diploma of Higher Education.

Chemistry Core Modules (Total 45 ECTS)

CHEM2001	Organic Reaction Mechanisms
CHEM2005	Aspects of Organic Synthesis
CHEM2012	Change and Equilibria
CHEM2013	Atomic and Molecular Interactions
CHEM2015	Intermediate Inorganic Chemistry I
CHEM2016	Intermediate Inorganic Chemistry II

Part 3 (FHEQ Level 6)

This consists of 37.5 ECTS of compulsory chemistry plus 22.5 ECTS of subsidiary/optional modules. If successfully completed, students can leave with a Bachelor of Science.

Chemistry Core Modules (Total 37.5 ECTS)

CHEM3037	Advanced Inorganic Chemistry
CHEM3038	Advanced Organic Chemistry
CHEM3039	Advanced Physical Chemistry
CHEM3012	Chemistry Research Project

PART 4 (Level 7)

This consists of 52.5 ECTS of compulsory chemistry plus 7.5 ECTS of optional modules in chemistry. Note that 60 ECTS at Level 7 must be taken to be awarded the MChem degree.

Compulsory Chemistry modules (Total 52.5 ECTS)

CHEM6139	Chemistry Year-long placement
CHEM6140	Distance Learning for year-long placement students
CHEM6138	Chemical Enterprise and Professional Skills

Additional Costs

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. Costs that students registered for this programme typically also have to pay for are included in Appendix 2.

Progression Requirements

The programme follows the University's regulations for [Progression, Determination and Classification of Results: Undergraduate and Integrated Masters Programmes](http://www.calendar.soton.ac.uk/) as set out in the University Calendar (<http://www.calendar.soton.ac.uk/>).

Those specific to the Faculty, the Academic Unit and your programme are in Section IX – Faculty of Natural and Environmental Sciences, <http://www.calendar.soton.ac.uk/sectionIX/sectIX-index.html>
<http://www.calendar.soton.ac.uk/sectionIV/part5a.html>

Intermediate exit points

You will be eligible for an interim exit award if you complete part of the programme but not all of it as follows:

Qualification	Minimum overall credit in ECTS credits	Minimum ECTS Credits required at level of award
Bachelor of Science (Honours)	at least 180	45
BSc of Science (Ordinary)	at least 150	30
Diploma of Higher Education	at least 120	45

Certificate of Higher Education	at least 60	45
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Learning outcomes specific to each intermediate exit point correspond to a sub-set of those for the programme as a whole and may be determined by consulting the module map at the end of this document.

Qualification	
Bachelor of Science (with Honours)	The detailed learning outcomes for the BSc Honours Degree are given BSc Chemistry programme specification (see: http://www.southampton.ac.uk/chemistry/undergraduate/courses/f100_bsc_chemistry.page?)
Bachelor of Science (Ordinary)	<p>Bachelor of Science (Ordinary) are awarded to students who have demonstrated:</p> <ul style="list-style-type: none"> Detailed knowledge and critical understanding of the essential theories, principles and concepts of chemistry as a whole. Development of extensive analytical and practical skills in chemistry, with an awareness of the applicability of a wide range of synthetic and analytical methods. Ability to apply underlying concepts and principles outside the context in which they were first studied, such as the application of principles of current issues in the chemical sciences. Problem solving skills and the ability to evaluate critically the appropriateness of different approaches to solving subject related problems. An understanding of the limits of their knowledge and the errors inherent in measurements, and how this influences analyses and interpretations based on that knowledge. An ability to obtain and synthesise knowledge from a range of sources. An ability to formulate independent opinions on subject material, and show some ability at critical analysis of published literature, and other well-defined situations. An ability to formulate and communicate arguments in both written and verbal formats, both independently and whilst working as a team. <p>Typically, holders of the qualification will be able to:</p> <ul style="list-style-type: none"> use their knowledge, understanding and skills, in both identifying and analysing problems and issues and in formulating, evaluating and applying evidence-based solutions and arguments; communicate the results of their studies and other work accurately and reliably in a range of different contexts using the main specialist concepts, constructs and techniques of the subject(s); identify and address their own learning needs, including being able to draw on a range of current research, development and professional materials; apply their subject and transferable skills to contexts where criteria for decisions and the scope of the task may be well defined but where personal responsibility, initiative and decision-making is also required. <p>And holders will have:</p> <ul style="list-style-type: none"> the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility and decision-making.
Diploma of Higher Education	<p>Diplomas of Higher Education are awarded to students who have demonstrated.</p> <ul style="list-style-type: none"> Knowledge and critical understanding of the well-established principles of inorganic, organic, and physical chemistry, the principles of learning as applied to a range of techniques relevant to these main sub-disciplines of chemistry, understanding the techniques and methodology of practical chemistry. Ability to apply underlying concepts and principles outside the context in which they were first studied, such as the application of principles of current issues in the chemical sciences. Knowledge of the main methods of enquiry in chemistry, and ability to evaluate critically the appropriateness of different approaches to solving subject related problems. An understanding of the limits of their knowledge, and how this influences analyses and interpretations based on that knowledge. An ability to obtain and synthesise knowledge from a range of sources. An ability to formulate independent opinions on subject material, and show some

	<p>ability at critical analysis of published literature.</p> <ul style="list-style-type: none"> An ability to formulate and communicate arguments in both written and verbal formats, both independently and whilst working as a team. <p>Typically, holders of the qualification will be able to:</p> <ul style="list-style-type: none"> use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively <p>And holders will have:</p> <ul style="list-style-type: none"> the qualities and transferable skills necessary for employment requiring the exercise of personal responsibility and decision-making.
Certificate of Higher Education	<p>Certificates of Higher Education are awarded to students who have demonstrated:</p> <ul style="list-style-type: none"> Knowledge of the underlying concepts and principles of inorganic, organic, and physical Chemistry and its practical application. Students should show an ability to evaluate and interpret their knowledge in these areas. An ability to present, evaluate and interpret qualitative and quantitative data, to develop lines of argument and make sound judgements in accordance with the basic theories and concepts that they have been exposed to. An ability to communicate ideas in written and verbal form <p>Typically, holders of the qualification will be able to:</p> <ul style="list-style-type: none"> evaluate the appropriateness of different approaches to solving chemical problems, as well as to the concepts of learning communicate the results of their study/work accurately and reliably, and with structured and coherent arguments undertake further training and develop new skills within a structured and managed environment. <p>And holders will have:</p> <ul style="list-style-type: none"> the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility.

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources;
- high speed access to online electronic learning resources on the Internet from dedicated PC; Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations;
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources);
- standard ICT tools such as Email, secure filestore and calendars;
- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move;
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library;
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia); the Student Services Centre (SSC) to assist

you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards;

- Career Destinations, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV;
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls (18.00-08.00); a Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides:

- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- support for student peer-to-peer groups, such as Nightline.

Associated with your programme you will be able to access:

- Induction at the start of the course - programme for orientation, information on modules, courses, library and computer facilities.
- Well-equipped laboratories.
- Access to all administrative and academic material on the Academic Unit, Programme and individual module web sites and/or [Blackboard](#).
- Programme Handbooks
- Academic and pastoral support from members of staff, including your personal academic tutor, which will include scheduled meetings at appropriate occasions during the academic year.
- Access to all academic staff through an appointment system and e-mail.
- Access to administrative staff in the Faculty Student Offices during the normal working day.

Methods for evaluating the quality of teaching and learning

You will have the opportunity to have your say on the quality of the programme in the following ways:

- Completing student evaluation questionnaires for each module of the programme
- Acting as a student representative on various committees, e.g. Staff:Student Liaison Committees, Faculty Programmes Committee, Chemistry Educational and Quality Committee, OR providing comments to your student representative to feed back on your behalf.
- Serving as a student representative on Faculty Programmes Scrutiny Groups for programme validation
- Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Programmes Scrutiny Group

The ways in which the quality of your programme is checked, both inside and outside the University, are:

- Regular module and programme reports which are monitored by the Faculty
- Programme validation, normally every five years.
- External examiners, who produce an annual report
- Accreditation approval processes carried out by the Royal Society of Chemistry
- A national Research Assessment Exercise (our research activity contributes directly to the quality of your learning experience)
- Institutional Review by the Quality Assurance Agency

Criteria for admission

The University's Admissions Policy (see www.southampton.ac.uk/admissions-policy) applies equally to all programmes of study. The following are the typical entry criteria we use for selecting candidates for admission to our programmes.

Entry Requirements

These requirements are reviewed annually by our Admissions team.

2016-17 Entry (correct as of August 2015):

GCSEs:

If you are not studying maths at A level (or an equivalent standard in other qualifications approved by the University), we require an A grade in Mathematics GCSE supplementary to your A level (or an equivalent standard in other qualifications approved by the University) qualifications (but a B may be considered), and also grade C in GCSE English Language (or an internationally recognised equivalent standard in other qualifications approved by the University).

A Levels:

Our typical offers for students who are studying 3 A-levels are:

AAB for students taking Chemistry with two other acceptable science or mathematics subjects

AAA for students taking Chemistry with one other acceptable science or mathematics subject

Each application to study the integrated MChem masters degree in chemistry is considered on its own merit, and under certain circumstances we may make an offer to an individual applicant which differs from those outlined above. Acceptable science or mathematics subjects include Physics, Biology, Mathematics and Further Mathematics. Human Biology and Geology will be considered.

Students studying Chemistry, with no additional acceptable science/mathematics subject, may be interviewed to determine suitability for the course. We may also in some circumstances, recommend an alternative offer for the BSc programme. However, our flexible programme structure would allow transfer to this MChem programme, pending good performance in Year 1.

Alternative qualifications

Scottish Highers/Advanced Highers: AAAA-AAAB at Higher level and AA-AB at Advanced Higher to include Chemistry and one other other acceptable science or mathematics subject.

Irish Leaving Certificate: minimum A1, A1, A1, A1, A1, A2 including Chemistry and at least one other acceptable science or mathematics subject at Higher Level.

International applications

IB: 34 points on the IB scale, to include 18-17 points at the higher level, including Chemistry with at least one other acceptable science or mathematics subject at Higher Level.

The same consideration will be given to IB students studying Chemistry, with no additional acceptable science/maths subject at HL, as those A-level students, as detailed above.

European Baccalaureate: Average of 85-80% or better across all units of study with a minimum of 8 in Chemistry and Mathematics.

Diploma and Advanced Diploma (Overseas applicants): We are happy to receive applications for this degree in chemistry from students who have taken college/polytechnic diplomas in chemistry and will make offers either for entry into the first year or second year. For second year entry, you must have achieved a very high standard in your diploma and your curriculum must have included the majority of the chemistry that we teach in our first year.

2017-18 Entry (correct as of May 2016):

GCSEs:

If you are not studying maths at A level (or an equivalent standard in other qualifications approved by the University), we require an A/7 grade in Mathematics GCSE supplementary to your A level (or an equivalent standard in other qualifications approved by the University) qualifications (but a B/6 may be considered), and also grade C/4 in GCSE English Language (or an internationally recognised equivalent standard in other qualifications approved by the University).

A Levels:

Our typical offer for students who are studying 3 A-levels is:

AAA for students taking Chemistry with one other acceptable science or mathematics subject

Each application to study the integrated MChem masters degree in chemistry is considered on its own merit. Standard offers are made based on the application as a whole, including combination of subjects taken, and predicted grades. Offers may be subject to adjustment, based on discussion with the applicant, formal interview (if deemed necessary), or on a contextual basis. Under certain circumstances we may make an offer to an individual applicant which differs from those outlined above. Acceptable science or mathematics subjects include Physics, Biology, Mathematics, Further Mathematics, Human Biology and Geology.

Students studying Chemistry, with no additional acceptable science/mathematics subject, may be interviewed to determine suitability for the course. We may also in some circumstances, recommend an alternative offer for the BSc programme. However, our flexible programme structure would allow transfer to this MChem programme, pending good performance in Year 1.

Alternative qualifications

Our admissions requirement is normally defined on the basis of A/AS levels, but an equivalent standard in other qualifications approved by the University is accepted. For example, we will also accept applications from candidates offering Scottish and Irish Highers, European and International Baccalaureate, Access and Foundation courses and overseas qualifications.

More information on the entry requirements for this programme can be found on the Chemistry webpage [here](#).

Scottish Highers/Advanced Highers: AAAA at Higher level and AA at Advanced Higher to include Chemistry and one other acceptable science or mathematics subject.

Irish Leaving Certificate: minimum A1, A1, A1, A1, A1, A1 including Chemistry and one other acceptable science or Mathematics subject at Higher Level.

International applications

IB: 36 points on the IB scale, including 6 in Chemistry at Higher Level.

The same consideration will be given to IB students studying Chemistry, with no additional acceptable science/maths subject at HL, as those A-level students, as detailed above.

European Baccalaureate: Average of 85% or better across all units of study with a minimum of 8 in Chemistry and Mathematics.

Diploma and Advanced Diploma (Overseas applicants): We are happy to receive applications for this degree in chemistry from students who have taken college/polytechnic diplomas in chemistry and will make offers either for entry into the first year or second year. For second year entry, you must have achieved a very high standard in your diploma and your curriculum must have included the majority of the chemistry that we teach in our first year.

English Language Proficiency

All programmes at the University of Southampton are taught and assessed in the medium of English (other than those in modern foreign languages). Therefore, all applicants must demonstrate they possess at least a minimum standard of English language proficiency. Our minimum standard entry requirements are an IELTS Band C, i.e.

Overall	Reading	Writing	Speaking	Listening
6.5	5.5	5.5	5.5	5.5

Information on all acceptable English Language Tests can be found on the University website:

www.southampton.ac.uk/admissions-language

Recognition of Prior Learning (RPL)

The University has a Recognition of Prior Learning Policy. It may be possible to recognise formal credit for learning you have acquired in the past through formal study and/or through work and other life experiences. Your application will be considered on individual merit and you may be asked to attend an interview.

Mature applicants

Studying for a degree later in life can be extremely rewarding and mature students are often among our most successful.

If you are over 21 and feel you would benefit from degree-level studies, we can be more flexible about our entry requirements. For full-time courses, selectors will expect you to demonstrate your commitment by means of some recent serious study, for example, one or two A level passes, successful completion of an Open University foundation course or an appropriate Access course. Your application will be considered on individual merit and you may be asked to attend an interview.

Another popular option is to follow a certificate or diploma programme. These are available on a part time basis and most can be taken in the evenings, enabling you to continue to earn an income while you are studying. You do not need any formal qualifications to enrol.

More information on the entry requirements for Chemistry can be found on the Chemistry webpage here - <http://www.southampton.ac.uk/undergraduate/courses/chemistry.shtml>

For further information, please contact our Admissions Team ugafnes@soton.ac.uk

Career Opportunities

Employability is about more than just getting a job. We believe in helping our students gain the necessary experience for a future career, along with the skills to identify opportunities and make the most of them. It is reassuring to know that Chemistry degrees are third only behind Medicine and Dentistry as the degree which offers the highest financial return over the term of the graduate's career, but the rewards of a BSc Chemistry degree lie at a deeper personal level and not just in terms of financial return.

During your years here you will have the opportunity to broaden your options by meeting employers, getting involved in volunteering activities, work placements and much more.

A significant proportion of our graduates decide to go into research by taking a PhD qualification, most of them staying in Southampton. But careers in industry and commerce are available even in the toughest economic times.

There are also research and teaching opportunities and the options to branch out into other fields such as medicine, pharmaceuticals, even finance, and the law and science journalism. This is because chemistry gives you the confidence to take on so many varied challenges in life.

With a Chemistry degree from the University of Southampton your career path will be limited only by the level of your commitment and determination.

External Examiners(s) for the programme

External Examiners are normally appointed for periods of three years, with one new external examiner appointed each year in rotation.

Name Professor Michaele Hardie (Inorganic Chemistry, 2014/15 – 2016/17)
Institution University of Leeds

Name Professor Nick Westwood (Organic Chemistry, 2015/16 – 2017/18)
Institution University of St. Andrews

Name Professor Patrick Unwin (Physical Chemistry, 2016/17 – 2018/19)
Institution University of Warwick

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff: Student Liaison Committee in the first instance, and Student representatives on Staff: Student Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process. External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their personal tutor in the first instance.

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 s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook (or other appropriate guide) or online at <http://www.southampton.ac.uk/chemistry/undergraduate/courses.page?>

Assessment Mapping

Module Code	Module Title	Coursework	Exam
CHEM1008	Environmental Chemistry 1: Aquatic Chemistry	Coursework Plan (20%) 2 x In-class Tests (20%) Essay (60%)	None
CHEM1031	Fundamentals of Organic Chemistry I	Practical Reports (25%)	1.5 hour theory exam (75%)
CHEM1032	Fundamentals of Organic Chemistry II	Practical Reports (25%)	2 hour theory exam (75%)
CHEM1033	Fundamentals of Physical Chemistry I	Practical Reports (12.5%)	1.5 hour theory exam (75%) 1 hour Maths exam (12.5%)
CHEM1034	Fundamentals of Physical Chemistry II	Practical Reports (12.5%)	1.5 hour theory exam (75%) 1 hour Maths exam (12.5%)
CHEM1035	Fundamentals of Inorganic Chemistry I	Practical Reports (25%)	1.5 hour theory exam (75%)
CHEM1036	Fundamentals of Inorganic Chemistry II	Practical Reports (25%)	2 hour theory exam (75%)
CHEM1040	Introduction to Analytical Chemistry	Coursework 34% Group Project Joint Report 33% Group Project Presentation 33%	None
CHEM2001	Organic Reaction Mechanisms	Practical (25%)	2 hour theory exam (75%)
CHEM2005	Aspects of Organic Synthesis	Practical (25%)	2 hour theory exam (75%)
CHEM2010	Environmental Organic Chemistry	None	2 hour theory exam (100%)
CHEM2012	Change and Equilibrium	Practical (25%)	2 hour theory exam (75%)
CHEM2013	Atomic and Molecular Interactions	Practical (25%)	2 hour theory exam (75%)
CHEM2015	Intermediate Inorganic Chemistry I	Practical (25%) In-class test (5%)	2 hour theory exam (70%)
CHEM2016	Intermediate Inorganic Chemistry II	Practical (25%) In-class test (5%)	2 hour theory exam (70%)
CHEM2017	Quantitative Models in Chemistry	2 assignments (55%) 1 assignment (45%)	None
CHEM3002	Medicinal Chemistry	None	2 hour theory exam (100%)
CHEM3004	Materials Chemistry	None	2 hour theory exam (100%)
CHEM3036	Atmospheric Chemistry	None	2 hour theory exam (100%)
CHEM3012	Chemistry Research Project	Supervisor Evaluation (20%) Dissertation (50%) 10 minute presentation/10 minute Q&A session (20%)	None
CHEM3027	Communicating and Teaching and the Undergraduate Ambassadors Scheme	Report (60%) Presentation (25%) Teacher's Report (15%)	None
CHEM3037	Advanced Inorganic Chemistry	None	2 hour theory exam (100%)
CHEM3038	Advanced Organic Chemistry (Bio-organic)	None	2 hour theory exam (100%)
CHEM3039	Advanced Physical Chemistry	None	2 hour theory exam (100%)
CHEM6004	Advanced Organic Reactions	None	2 hour theory exam (100%)

CHEM6092	Medicinal Chemistry	None	2.5 hour theory exam (100%)
CHEM6093	Organic Materials Chemistry	Presentation (10%) Coursework (15%)	2.5hour theory exam (100%)
CHEM6094	Advanced Inorganic Chemistry	None	2.5 hour theory exam (100%)
CHEM6095	Advanced Organic Chemistry (Bio-organic)	None	2.5 hour theory exam (100%)
CHEM6096	Advanced Physical Chemistry	None	2.5 hour theory exam (100%)
CHEM6103	Sustainable Chemistry	Joint Report and Presentation (30%)	2.5 hour theory exam (70%)
CHEM6104	Supramolecular Chemistry: From Molecules to Nanomaterials	None	1 hour theory exam (100%)
CHEM6105	Crystallography and Structural Science	None	1 hour theory exam (100%)
CHEM6106	Functional frameworks materials	None	1 hour theory exam (100%)
CHEM6107	Advanced Main Group Chemistry	None	1 hour theory exam (100%)
CHEM6108	Synthesis of Natural Products and Pharmaceuticals	None	1 hour theory exam (100%)
CHEM6109	Advanced Bioorganic Chemistry	None	1 hour theory exam (100%)
CHEM6110	Applications of Electrochemistry	None	1 hour theory exam (100%)
CHEM6111	Nanoscience: Technology and Advanced Materials	None	1 hour theory exam (100%)
CHEM6112	Chemical Modelling	None	1 hour theory exam (100%)
CHEM6113	Nuclear Magnetic Resonance Spectroscopy	None	1 hour theory exam (100%)
CHEM6126	Advanced Spectroscopy and its applications	None	1 hour theory exam (100%)
CHEM6128	Data-Driven Science	Project (30%)	1 hour theory exam (70%)
CHEM6137	Atoms, Molecules and Spin; Quantum Mechanics in Chemistry and Spectroscopy	None	2.5 hour theory exam (100%)
CHEM6138	Chemical Enterprise	Reflective Blog (80%) Presentation (20%)	None
CHEM6139	Chemistry Year-long Placement	Placement Supervisor's evaluation (10%) Dissertation (55%) Viva (20%) Presentation (15%)	
CHEM6140	Distance Learning for Year-long placement students	Learning Pack assessment (20%)	Synoptic examination (80%)

Appendix 2:

Additional Costs

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme typically also have to pay for the items listed in the table below.

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in the University Calendar available at <http://www.calendar.soton.ac.uk/>.

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
Approved Calculators		Candidates may use calculators in the examination room only as specified by the University and as permitted by the rubric of individual examination papers. The University approved models are Casio FX-570 and Casio FX-85GT Plus. These may be purchased from any source and no longer need to carry the University logo.
Stationery		You will be expected to provide your own day-to-day stationary items, e.g. pens, pencils, notebooks, etc.). Any specialist stationery items will be specified under the Additional Costs tab of the relevant module profile.
Textbooks		Where a module specifies core texts these should generally be available on the reserve list in the library. However due to demand, students may prefer to buy their own copies. These can be purchased from any source. Some modules suggest reading texts as optional background reading. The library may hold copies of such texts, or alternatively you may wish to purchase your own copies. Although not essential reading, you may benefit from the additional reading materials for the module.
Equipment and Materials Equipment	Laboratory Equipment and Materials:	All laboratory equipment and materials are provided.
IT	Computer Discs or USB drives	Students are expected to provide their own portable data storage device.
	Software Licenses	All software is provided
	Hardware	It is advisable that students provide their own laptop or personal computer, although shared facilities are available across the University campus.
Clothing	Lab Coats and safety spectacles	One laboratory coat and a pair of safety spectacles are provided at the start of the programme to each student. If these are lost the student must replace them at their own expense.
Printing and Photocopying Costs		In the majority of cases, coursework such as essays; projects; dissertations is likely to be submitted on line. However, there are some items where it is not possible to submit on line and students will be asked to provide a printed copy. Current University printing costs can be found here Please Note: Paper sizes not recognised by the printing devices will prompt you to select the size and then charge a minimum of 50p per black and white copy and a maximum of £1 per colour copy.

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
		<p>You can pay for your printing by using the money loaders or by using print copy payment service by going to https://www.printcopypayments.soton.ac.uk/</p> <p>Please remember that we are unable to refund any credit that has not been used by the end of your course, so please consider this when topping up your printing/copy account</p> <p>You will be given a printing allowance of £5 per 7.5 ECTS pro-rata towards the costs of printing lecture handouts and/or practical scripts for each of the core chemistry lecture modules.</p>
Placements (including Study Abroad Programmes)		<p>Students on placement programmes can expect to cover costs for health and travel insurance, accommodation and living expenses; travel costs; visa costs. This will vary depending on which country you are travelling to. Specific details on what additional costs there will be are detailed in the individual module profiles which can be found under the modules tab of the programmes details of your programme.</p>

Revision History

1. 2013/14 Academic Year version (amended ECTS) CQA
2. CQA updates September 2014
3. Updated to take account of revision to December 2014 Chemistry benchmark statements: February 2015
4. Mapping completed July 2015
5. Updated to take account of new Programme Specification template, September 2015
6. Updates for 2016/17