

Programme Specification

MChem Chemistry (MChem)

For students entering Part 1 in September 2024

UCAS Code: F103

UFCHEMM

This document sets out key information about your Programme and forms part of your Terms and Conditions with the University of Reading.

Awarding Institution	University of Reading
Teaching Institution	University of Reading
Length of Programme	4 years
Accreditation	The Royal Society of Chemistry
QAA Subject Benchmarking Group	Chemistry

Programme information and content

The programme aims to provide the next generation of chemists with a broad coverage of the core disciplines within Chemistry. You will study a range of chemistry topics ranging from Analytical, Organic, Inorganic and Physical Chemistry; along with Contemporary issues in Chemistry and Chemistry in the Natural World, as part of the four year MChem chemistry programme. These topics are reinforced through extensive practical laboratory experiences in our modern laboratories which will enable you to develop your skills as a competent chemist. Throughout the course there will be opportunities to work individually or as part of a team; this may take the form of a practical experiment or an oral presentation or a group exercise. These opportunities are designed to give you high-level intellectual and scientific training that will equip you for a range of challenging careers in the field of Chemistry and chemical research.

The programme takes you on an exciting journey of exploration through Chemistry. It is supportive, yet appropriately challenging and enables you to synthesise the skills and knowledge gained, so you can confidently access more advanced topics. Years 1 and 2 focus on fundamental core knowledge to enable you to progress to more challenging topics in later years. The MChem programme culminates in an individual research project tailored to your interests. This is complemented by a choice of optional modules in advanced chemistry, which expose you to cutting edge research in chemistry, and offer opportunities to apply your learning to solve problems and think critically about real-world challenges.

Part 1:	Introduces you to the basic underpinnings of Inorganic, Organic and Physical Chemistry. Through material that will begin as a revision of A-level topics, it will progress rapidly and will present this familiar material in a new light. The goal of year 1 is to give you the tools necessary to help you become an independent learner, providing the necessary background to enable rationalisation and predictions for unseen processes and reactions.
Part 2:	Provides you with a more in-depth study of Inorganic, Organic and Physical Chemistry. The second year sees the introduction of a dedicated stream of Analytical chemistry that is also reflected in the content of the practical classes. The material covered in the second year is challenging, it builds on the content of

	<p>year 1 and extends the complexity and depth of study to allow study and analysis of real world problems. Much of the material introduced in year 2 is still regarded as fundamental and a thorough understanding of the content is required for study in year 3.</p>
Part 3:	<p>Gives you the opportunity to begin to see the application of Chemistry at the forefront of its applications. The content is deliberately broad, covering all four streams of the discipline. The material becomes more specialised and you will experience this through study of a series of smaller self-contained units within your core modules. The third year relies heavily on accumulated knowledge built up in years 1 and 2.</p> <p>The third year also begins to refine some of the skills necessary for a successful research career. Many of these skills will be familiar, having been introduced in parts 1 and 2; the third year draws these together and refines them through both practical and library research focused modules.</p>
Part 4:	<p>The main component of the final year will comprise the research project. As an individual researcher, you will have a chance to undertake a piece of research work that is your own. You will work with an academic supervisor who will advise and encourage you to develop the work to its fullest extent that the time limits permit. The allocation of academic supervisor will be made towards the end of your third year; you will have the chance to meet academics to discuss research at the Project Showcase, after this session you will be able to express interest in a potential project and supervisor. More details on projects and the selection process can be found in the project handbook.</p> <p>The project is complemented by a number of advanced chemistry modules, some are compulsory and some are available as options. The compulsory modules ensure a broad tuition in the core areas of chemistry and the optional modules allow some specialization into areas of chemistry that reflect your personal interests.</p>

Programme Learning Outcomes - MChem Chemistry (MChem)

During the course of the Programme, you will have the opportunity to develop a range of skills, knowledge and attributes (known as learning outcomes) For this programme, these are:

Learning outcomes	
1	Formulate and explain a broad and balanced range of fundamental chemical concepts in the core areas of the discipline (Organic Chemistry, Inorganic Chemistry, Analytical Chemistry and Physical Chemistry and applied topics).
2	Work safely and competently in the laboratory by assessing and mitigating potential risks they may encounter, and applying health & safety and laboratory safe practice.
3	Apply appropriate methodologies and practical skills to solve a range of problems in chemistry.

4	Develop planning and investigative skills that draw on the existing literature to form new insights and propose avenues for further exploration.
5	Organize and interpret scientific information from the literature or the laboratory to produce written work such as lab reports, essays and dissertations for varied purposes and audiences.
6	Employ their knowledge and skills base (such as effective teamworking, ability to work autonomously and to demonstrate high-level practical skills) from which they can proceed to graduate employment or to further research studies in chemistry or multidisciplinary areas involving chemistry.
7	Effectively communicate information and chemical concepts at a level and in a format appropriate to the needs of a variety of purposes and target audiences.
8	Articulate the interfaces between chemistry and other subjects in which chemical approaches contribute to progress and advances at the forefront of the chemical sciences.
9	Critically analyse how specialised areas of chemistry, based upon key chemical concepts, have wider applications and impacts and have relevance in a real-world context.
10	Develop ideas, critically review literature, plan and carry out original investigations independently and assess and report the significance of outcomes.
11	Accurately interpret and analyse data to generate solutions to unfamiliar problems.
12	Demonstrate the ability to independently and creatively plan and execute complex research projects.

You will be expected to engage in learning activities to achieve these Programme learning outcomes. Assessment of your modules will reflect these learning outcomes and test how far you have met the requirements for your degree.

To pass the Programme, you will be required to meet the progression or accreditation and award criteria set out below.

Module information

Each part comprises 120 credits, allocated across a range of compulsory and optional modules as shown below. Compulsory modules are listed.

Part 1 Modules:

Module	Name	Credits	Level
CH1CP1	Contemporary Problems in Chemistry	20	4
CH1IN1	Fundamentals of Atomic Structure and the Periodic Table	20	4
CH1MA1	Mathematics for Chemists	20	4
CH1OC2	Shape, Structure and Reactivity in Organic Chemistry	20	4
CH1PP2	Physical Processes and Molecular Organisation	20	4
CH1PR1	Chemistry Practicals 1	20	4

Part 2 Modules:

Module	Name	Credits	Level
CH2IN1	Further Inorganic Chemistry	20	5
CH2OR1	Further Organic Chemistry	20	5
CH2PH2	Further Physical Chemistry	20	5
CH2PR1	Chemistry Practicals 2	40	5

Remaining credits in semester 2 will be made up of optional modules available in the Chemistry Department.

If you take a year-long placement or study abroad, Part 3 as described below may be subject to variation.

Part 3 Modules:

Module	Name	Credits	Level
CH3CC1	Chemistry Core 1 (Inorganic and Organic)	20	6
CH3CC2	Chemistry Core 2 (Physical and Analytical)	20	6
CH3PR1	Chemistry Labs and Research Skills	40	6

Remaining credits in semester 2 will be made up of optional modules available in the Chemistry Department.

Part 4 modules:

Module	Name	Credits	Level
CH4PR1	MChem Research Project	60	7

The remaining 60 credits for part 4 will be made up of optional modules available in the Department of Chemistry.

The modules can be selected as follows:

If 40 credits are selected from the modules offered in Semester 1, then 20 credits must be selected from the modules available in Semester 2.

OR

If 20 credits are selected from the modules offered in Semester 1, then 40 credits must be selected from the modules offered in Semester 2.

Placement opportunities

N/A

Optional modules:

The optional modules available can vary from year to year. An indicative list of the range of optional modules for your programme can be found online in the Course Catalogue. Details of optional modules for each part, including any additional costs associated with the optional modules, will be made available to you prior to the beginning of the Part in which

they are to be taken and you will be given an opportunity to express interest in the optional modules that you would like to take. Entry to optional modules will be at the discretion of the University and subject to availability and may be subject to pre-requisites, such as completion of another module. Although the University tries to ensure you are able to take the optional modules in which you have expressed interest this cannot be guaranteed.

Teaching and learning delivery:

You will be taught through a wide range of approaches to teaching and learning in our programmes, spanning from seminars and digitally-enabled learning activities, to workshops and practical classes. These aim to maximise your engagement and accommodate students with different learning styles. The latter ensures that our teaching is diverse and inclusive, as our students are from a wide variety of different backgrounds with very different learning experiences. Within the design of the programmes, we aim to incorporate time for you to reflect on your learning.

You are taught throughout the programme by highly research-active staff who are able to ensure that you learn about current research in their discipline. In the final year project, many of you will be involved in cutting-edge Chemistry research projects and become an integral part of the different research groups within the department.

We use pedagogies appropriate to the discipline with a student-centred learning paradigm. This means that our main role is to guide and facilitate your learning and provide relevant learning opportunities. You will be expected to be an active learner and contribute to the learning process, building knowledge and understanding in response to opportunities provided. You will develop your existing chemistry knowledge in order to achieve deeper levels of understanding, allowing you to analyse, evaluate and synthesize ideas. Our teaching is informed by the concept of constructive alignment, ensuring that the components of the teaching system are aligned to each other.

Elements of your programme will be delivered via digital technology.

The scheduled teaching and learning activity hours and amount of technology enhanced learning activity for your programme will depend upon your module combination. In addition, you will undertake some self-scheduled teaching and learning activities, designed by and/or involving staff, which give some flexibility for you to choose when to complete them. You will also be expected to undertake guided independent study. Information about module study hours including contact hours and the amount of independent study which a student is normally expected to undertake for a module is indicated in the relevant module description.

Accreditation details

The Royal Society of Chemistry

Assessment

The programme will be assessed through a combination of written examinations, coursework (including class tests) and oral examinations. Further information is contained in the individual module descriptions.

Progression

Part 1

To achieve a threshold performance at Part 1, a student will normally be required to:

- (i) Obtain an overall average of 40% over 120 credits taken in Part 1;
- (ii) Obtain a mark of at least 40% in individual modules amounting to not less than 80 credits taken in Part 1; and
- (iii) Obtain marks of at least 30% in modules amounting to 120 credits.

In order to progress from Part 1 to Part 2, a student shall normally be required to achieve a threshold performance at Part 1 and:

- (iv) achieve a module mark of at least 40% in CH1PR1, and
- (v) meet the required laboratory and classroom-based practical attendance in CH1PR1 (85%)

The achievement of a threshold performance at Part 1 qualifies a student for a Certificate of Higher Education if they leave the University before completing the subsequent Part.

Students who meet threshold requirements but who do not meet the accredited programme-specific requirements may transfer to Part 2 of the BSc Chemical Sciences programme.

Transferring from a Joint Honours to a Single Honours programme

Students are able to transfer from a Joint Honours to a Single Honours programme in one of their joint subject areas at the end of Part 1, subject to fulfilling the Part 1 University Threshold Standard, achieving marks of at least 40% in at least 40 credits of modules in the subject to which they wish to transfer, and fulfilling any programme-specific progression rules for the Part 1 Single Honours Programme to which they wish to transfer.

Students who transfer from a Joint Honours to a Single Honours programme may not have taken all of the Part 1 modules listed in the Single Honours Programme Specification. The modules which they have taken will be shown on their Diploma Supplement.

Part 2

To achieve a threshold performance at Part 2, a student shall normally be required to:

- (i) Obtain a weighted average of 40% over 120 credits taken in Part 2; and
- (ii) Obtain marks of at least 40% in individual modules amounting to at least 80 credits taken in Part 2; and
- (iii) Obtain marks of at least 30% in individual modules amounting to at least 120 credits, except that a mark below 30% may be condoned in no more than 20 credits of modules owned by the Department of Mathematics and Statistics.

In order to progress from Part 2 to Part 3, a student must achieve a threshold performance and:

- (iv) achieve an overall average of 50% over 120 credits taken in Part 2 (of which not less than 100 credits should normally be at level 5 or above)
- (v) achieve a module mark of at least 40% in CH2PR1, and
- (vi) meet the required laboratory and classroom-based practical attendance in CH2PR1 (85%)

The achievement of a threshold performance at Part 2 qualifies a student for a Diploma of Higher Education if they leave the University before completing the subsequent Part.

Students who meet threshold requirements but who do not meet the integrated masters or accredited programme-specific requirements may transfer to Part 3 of the BSc Chemical Sciences programme.

Part 3

In order to progress from Part 3 to Part 4, a student must achieve:

- (i) an overall average of 40% over 120 credits taken in Part 3

Students who fail to achieve the progression requirement to Part 4 but meet the University's threshold for Bachelor's degrees may be eligible for the award of BSc Chemical Sciences in accordance with the University's Framework for Classification and Progression for First Degrees.

Classification

Bachelors' degrees

The University's honours classification scheme is based on the following:

Mark Interpretation

70% - 100% First class

60% - 69% Upper Second class

50% - 59% Lower Second class

40% - 49% Third class

35% - 39% Below Honours Standard

0% - 34% Fail

Integrated Masters Programmes (MEng, MMath, MChem etc.)

Part 2: 20%

Part 3: 40%

Part 4: 40%

The classification method is given in detail in [Section 18](#) of the Assessment Handbook (see, in particular, section 18.5).

Additional costs of the programme

During your programme of study you will incur some additional costs.

For textbooks and similar learning resources, we recommend that you budget between £50 to £150 a year. The core textbook(s), which most students normally purchase, cost(s) £65 new, and there may be other books/resources which you would find it convenient to buy. The core chemistry textbook is available in e-book format from the University library. Some books may be available second-hand, which will reduce costs. A range of resources to support your curriculum, including textbooks and electronic resources, are available through the library. Reading lists and module specific costs are listed on the individual module descriptions.

Printing and photocopying facilities are available on campus at a cost of £0.05 per page. Costs will be, on average, £10 per year.

As Chemistry is a practical subject, you will be provided with the relevant personal protective equipment during your course (laboratory coat and safety glasses).

Costs are indicative and may vary according to optional modules chosen and are subject to inflation and other price fluctuations. Estimates were calculated in 2023.

For further information about your Programme please refer to the Programme Handbook and the relevant module descriptions, which are available at <http://www.reading.ac.uk/module/>. The Programme Handbook and the relevant module descriptions do not form part of your Terms and Conditions with the University of Reading.

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