University of Reading

DEPARTMENT OF CHEMISTRY

SOLUTIONS THAT MATTER

Chemistry has a long tradition at the University of Reading; our first Professor of Chemistry was appointed over one hundred years ago. Since then, we have developed a reputation for excellence across both our Teaching and Research.

Chemistry hosts many excellent teachers, and amongst that number are two University Teaching Fellows.

Together we deliver a curriculum that provides a challenging and rewarding blend of research-led teaching, fundamental chemistry, practical work and skills development.

Our staff perform cutting-edge, interdisciplinary research that explores fields beyond the traditional boundaries of Chemistry. Recent research achievements include work that can dramatically reduce storage times for nuclear waste, molecules that selectively remove precious metals from contaminated land, and semiconducting materials that use waste heat for micro-generation of electricity.

Join us and help us to address society's greatest challenges.

Dr John McKendrick
Head of the Department
of Chemistry

www.reading.ac.uk/chemistry

"Be a physical chemist, an analytical chemist, an organic chemist, if you will; but above all, be a chemist."

IRA REMSEN
F. H. Getman,
The Life of Ira Remsen (1940)

> **“When students apply for jobs or PhD positions, they can talk about current topics, which I think is very important. What gives me the greatest satisfaction is seeing the development of an individual from a very raw scientist during their degree studies to walking out the door and travelling the world to new research and development positions in academia and industry.”**
>
> Professor Wayne Hayes

THE POWER OF SELF-HEALING POLYMERS

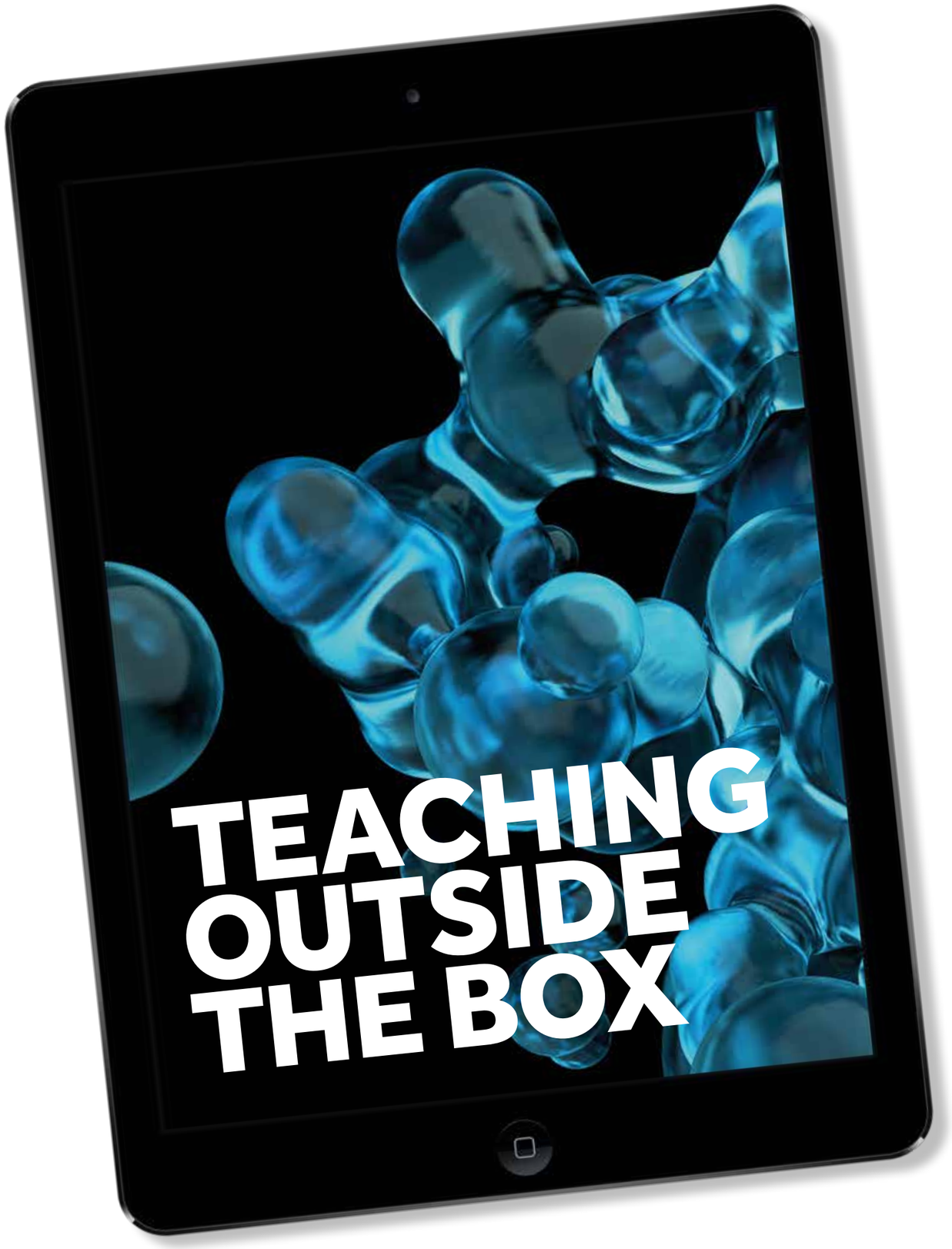
Cut yourself and – in most cases – your skin will heal with no trace of the cut. Do similar damage to the screen of your phone or the paintwork on your car and you won’t be so lucky. But what if our phones and cars could heal in the same way as our skin? Researchers at Reading, inspired by wound healing in nature, are developing self-healing polymers that can repair the damage caused by wear and tear and extend the lifetime, and lower the cost, of materials and devices.

Professor Wayne Hayes is working hard to make self-healing polymers a reality in a number of industrial applications. Wayne runs a research group developing healable materials here at the University of Reading. “We design and make polymers that have receptor groups within them, which can recognise each other…in solution they are discreet molecules, but when you take the solvent away these receptor groups assemble to make an infinite network. But just like the way nature operates, this recognition process between receptor groups is reversible, and it’s this reversibility that is the healing mechanism.

“Although still in its infancy, this research shows that these materials have the power to enable car and aircraft components to repair themselves when broken.”

As a research-intensive Department, our academics use their research to inform their teaching, providing cutting-edge content to undergraduate students. Wayne teaches fundamental polymer science, and uses this opportunity to teach his students about healability, as it is such
a topical area within the polymer field.

You will have the opportunity to make your mark in the lab on projects like this. You will be actively involved in research, working alongside researchers like Wayne on your final year research project. Past students have made a huge impact on the direction of research through exciting discoveries and observations – and you could too. The research carried out in the Department covers a wide range of areas, so you’ll have many fascinating projects to choose from. You could even see your name on an internationally-renowned scientific research paper.



Dr Philippa Cranwell plays a very active role in the Department of Chemistry at Reading. She'll guide you through your entire journey at the University; from applying to study at Reading, to finding a placement, to taking part in a research project, and choosing a career path.

Philippa realised her passion for teaching while helping her friends revise for exams as an undergraduate student. She started to teach more formally during her PhD studies, and she now teaches students from first year to final year.

"I've always been interested in teaching, and have always really enjoyed it, be it in a practical class or a more formal classroom setting. I like to think I'm quite approachable, so if a student has a problem or a question, they feel comfortable enough to come and ask me about it – chemistry-related or not.

She was awarded a University Teaching Fellowship in 2016, an accolade given to champions of teaching and learning. Philippa is always on the hunt for new ways to teach chemistry, to ensure the subject is accessible, yet interesting and exciting.

"In order for students to achieve the deep learning and understanding they need, the material needs to be taught in an engaging way. I am careful to make sure that my tutorials and lectures are dynamic, and encourage participation from students. I have integrated some problem-based learning, screencasts for knowledge transfer and online tests to reiterate important concepts in chemistry. When I try new teaching innovations or material I always ask students for their feedback."

Philippa will also support you if you're looking to undertake an industrial placement. She'll not only help you find a suitable placement, but will also regularly keep in contact during your year away from the University.

"I strongly believe that a placement is where students are really able to grow. I was lucky enough to complete a placement during my degree, which hugely benefitted my studies and developed my confidence. I try and help our students to find a placement and to support them as much as possible so they can have their own amazing experience."

Alongside her teaching and support roles in the Department, Philippa is an active researcher. As a final-year undergraduate student, you'll have the opportunity to work directly with Philippa on your research project, and may even get your name published on a research paper.

"When you've seen a student develop over their degree, and you know how much hard work they put into their studies, it's really rewarding to see them graduate and continue onto their next challenge."

THE BIG CLEAN

Laurence Harwood, Professor of Organic Chemistry, spent decades as a pharmaceutical chemist, until a colleague asked him to get involved in a project with the nuclear industry. He applied the same structure-activity relationship studies he was using in drug discovery to helping develop molecules that could be used to clean up nuclear waste, and his research took on a whole new set of challenges.

CLEANING UP NUCLEAR WASTE

While nuclear energy leaves no carbon footprint to speak of, it does leave a legacy of hazardous waste – spent nuclear fuel. Most countries just store it with the intention eventually of burying it deep underground and this is leading to a lot of material worldwide with storage times estimated at 300,000 years. There are, however, ways to clean up and reuse most of that spent fuel.

"If you start with 500kg of nuclear waste, 480kg of that is uranium and 5kg is plutonium; these can be separated using current technology, refabricated as a mixed oxide fuel and reused. This leaves only 15kg of waste that now only needs to be stored for 10,000 years. But the difference between 300,000 years and 10,000 years is like the difference between throwing an egg off a 30-storey building or a single-storey building – the result is the same."

Within that remaining 15kg of waste is about 450g of very hazardous elements – the minor actinides americium, neptunium and curium. These elements can be used as fuel in new generation nuclear reactors and used up completely. The remaining waste would only need to be stored for 300 years, which is a timeframe engineers can work with. The problem is separating those actinides from the rest of the waste.

"There are about 4–5kg of different lanthanides in that remaining waste, which are very similar chemically to the minor actinides, but if they were to be put into the new generation nuclear reactors, they would close the reactor down completely. So the problem is how to separate the dangerous actinides from the more abundant lanthanides in this waste – and that's what we've done."

Laurence and his colleagues have designed a family of molecules that selectively bind to the actinides, pulling them out of the waste with incredible specificity. While some of the details of how this happens need to be worked out before the industry can consider adopting the technology, it's moving in a direction that could make nuclear power generation a much more amenable and almost non-polluting process for use world-wide.

REDUCING THE IMPACT OF RARE EARTH METAL EXTRACTION

Meanwhile, there are applications for Laurence's molecules that are far more likely to be adopted in the shorter term. Rare earth metals (lanthanides) are contained in many of the technologies we use daily – from touchscreen phones to wind turbines. However, their extraction is complicated and has resulted in environmental devastation in Mongolia, which now produces 98% of the world's supply of rare earth metals.

"There are 14 lanthanides and they are all very similar. The current process to separate them all out involves over 60 steps that require very polluting chemicals. Even if we could separate them out into groups of 3–4 lanthanides, we could perhaps eliminate 30 of these steps and make the process far more efficient."

The ability to extract these elements selectively would also have applications in recycling, and the Reading group is now looking into the extraction of valuable metals, such as platinum and gold, from seawater.

STATE-OF-THE-ART SCIENCE

Our Chemical Analysis Facility (CAF) houses purpose-built instrumentation used by students and staff from departments across the University, as well as by commercial enterprises seeking the expertise and equipment we have available here on campus.

There are six platforms of instrumentation in the CAF: NMR spectroscopy, mass spectrometry, X-ray diffraction and scattering, optical spectroscopy, thermal analysis and electron microscopy. Each of these platforms has a dedicated technical lead who is an expert with the instrumentation, as well as an academic lead, who is a world expert in the technique.

"I think this is what makes this facility unique at Reading," explains Laurence Harwood, Professor of Organic Chemistry and Director of the CAF. "We not only have the instrumentation, we have the people who facilitate world-class research."

Laurence knows first-hand how sophisticated instrumentation can catalyse research. After spending decades as a pharmaceutical chemist, Laurence is now applying the same methods he used in drug discovery to helping develop molecules that could be used to clean up nuclear waste and reduce the impact of rare earth metal extraction – research with potentially global impact.

Professor Laurence Harwood

As Director of CAF, Laurence is responsible for making sure the machines are working 24/7 and that the facility remains cutting edge. "I volunteered for the job because I really wanted to do it. I enjoy that it's research-facing and I get to discuss research projects with the different users."

Students are one of the important user groups of the CAF. If you want hands-on experience using the analytical techniques available in our facility, we ensure you are given the opportunity to do so. As a project student in the final year of your undergraduate programme, you can choose to be trained up as a standard user with access to the instrumentation. Getting experience in the CAF will give you the practice you need to confidently use analysis facilities. It will also build skills and know-how that will give you an edge over other graduates, making you more attractive to employers.

WHERE WILL CHEMISTRY LEAD YOU?

Our Chemistry graduates are highly sought-after by employers. Professional chemists are in demand in many areas, but a degree in Chemistry can be a solid stepping stone on any career journey.

ACHIEVE THE CAREER YOU WANT

Our graduates go on to work in a wide range of sectors, including science, the environment, health and safety, forensics, food technology, pharmaceuticals and water analysis.

Past students have found work with organisations including Evotec, Pharmaterials, Intertek, Reed, the police, Pfizer, CEM Analytical Services and Thames Water.

Are you interested in teaching as a career? We offer the possibility of a school-based project in your final year, working alongside teachers and pupils on an individual project.

TRANSFERABLE SKILLS

A degree in Chemistry from the University of Reading will give you an invaluable skillset to enhance your career prospects. These skills include:

- Planning and organisation
- Handling information
- Communication
- Scientific and practical skills
- ICT
- Problem-solving and critical analysis
- Business awareness

THRIVING IN A SUPPORTIVE ENVIRONMENT

Our strong global network of alumni are keen to support the next generation by providing career mentoring to students in their penultimate year of study. Through the Thrive scheme, you can be partnered with successful professional alumni, who can discuss your aspirations and give you support on your ideas about graduate life.

Gagan Singh graduated from the MChem Chemistry programme at the University of Reading and is now a Scheme Project Manager at Network Rail, working on the Crossrail project. Although his career is outside of the Chemistry industry, the skills he gained during his degree gave him a solid foundation for his current role.

“One of the things a Chemistry degree is good at is helping you learn how to plan out what you are going to do. You get really good at juggling your life. Chemistry was also fantastic for learning how to present information. I did the master’s programme where you have to write up a dissertation and present it. You learn how to take your research and make it accessible to anyone – it is surprising how useful that has been. A Chemistry degree has given me a foundation where I’m able to understand more technical terms.”

Gagan Singh
MChem Chemistry graduate,
Scheme Project Manager at Network Rail

STUDY ABROAD

Life experience must be lived, not learned, and studying internationally can provide skills that are not easily obtained elsewhere. It's an opportunity to speak another language and learn to communicate inter-culturally. It's a chance to step out of your comfort zone and force yourself to meet new people, take initiative, problem-solve and build resilience. It's a time to get to know yourself and what you are capable of.

For Amie Parker, Spanish food is one of the things she misses most about her year abroad. She took part in the Erasmus (European Region Action Scheme for the Mobility of University Students) Programme in the third year of her MChem degree. She heard that the Department of Chemistry is linked with the University of Zaragoza due to its strengths in Chemistry and she leaped at the opportunity, despite only knowing some basic Spanish.

"Even though Zaragoza is the fifth largest city in Spain, English isn't commonly spoken. Everyone spoke English in the lab, but it was far more challenging outside of the University. What helped me a lot was the network of international friends I made through the Erasmus Programme."

The University of Reading offers support at all stages of your Study Abroad experience – from finding opportunities for funding to connecting you with people who have been through the Programme themselves.

Amie found tremendous support from a PhD student who had done the same placement as an undergraduate two years before her.

"She came over to visit friends that she had made while she was on her placement and as she had worked in the same lab, she was able to tell me how everything worked. I even stayed in the same flat she had rented! Her help made it much easier to settle in."

As well as enhancing your academic studies, international experience on your CV makes you more attractive to employers, improving your career prospects. Equally important, studying abroad is an adventure, which will stay with you regardless of where life's journey takes you next.

A SOLID START

Before Richard Blackall started studying at the University of Reading, he believed that following his graduation he would find a job and move away from the world of academia. However while working on his final year BSc project, Richard caught the organic-chemistry bug.

"I picked an organic chemistry project investigating new photochemical methodology towards the total synthesis of natural products. Not only did this project spark a lifelong interest in organic chemistry, photochemistry and natural products, it helped me discover a new passion."

The natural products Richard studied were extracted from rare plants used in herbal remedies and have been shown to possess anti-microbial and anti-cancer properties. During his short project, Richard learned practical synthetic techniques that set him up for a future career in chemistry.

Wishing to continue his research project, Richard chose to stay at Reading to complete an MSc degree. He initially set out to follow literature procedures to synthesise natural products.

"Most of the literature was written in the 1970s where health and safety was somewhat lacking. Most of the reagents used are now heavily restricted or banned in most laboratory environments. Thus, my project quickly evolved to find new means of synthesising compounds. My project required me to think on my feet and keep an open mind to any possible procedure. I learned to adapt and overcome by analysing results, isolating compounds and getting an understanding of the chemistry that was happening."

Richard is now completing a PhD where he is striving to overcome the challenges faced by natural products in clinical trials. Thus, his time spent at Reading still influences the work he does today.

"As part of the GSK-University of Strathclyde PhD programme, my Industrial PhD in Antibody Drug Conjugates (ADCs), focuses on an area that has not been investigated by GSK in the past. I am working with biology as well as chemistry and having no background in biology, I've found the skills I learned at Reading have actually helped me learn biology at an extremely rapid rate and my skills have dramatically improved."

Richard believes the synthetic chemistry skills he learned at Reading mean not only can he make compounds quickly and in high yields, he is also able to analyse results and suggest solutions to problems.

"The skill set I picked up has been hugely beneficial for my PhD and future career. I do believe I wouldn't be doing a PhD if it wasn't for my time at Reading and If I had to do it all again, Reading would be my first choice university."

“I am working with biology as well as chemistry and having no background in biology, I've found the skills I learned at Reading have actually helped me learn biology at an extremely rapid rate and my skills have dramatically improved.”

MARKET LEADING

Not many undergraduate students create a breakthrough product while on industrial placement. Even fewer expect to see their creation immediately marketed across the world. But our undergraduate student, Aisha Nuhu, achieved exactly that while working her industry year with local company Alchemy Ingredients.

Tasked with creating sustainable, palm oil-free cosmetic ingredients, Aisha developed a prototype range that is now being marketed internationally.

"Alchemy Ingredients specialises in thickeners and emulsifiers. I basically developed a new oil gelling agent for the company, trade name Sapogel Q, which was palm oil-free, fully sustainable and natural. It was based on saponins which are used in the cosmetic industry for their foaming abilities but we believe we were the first to develop a commercial product which uses them as an emulsifier."

Aisha is not alone in her experience of exciting and career-boosting work-place experiences. The University of Reading has a keen focus on placements, which strongly boost CVs and job opportunities for its students.

"It was this industry factor that helped me choose the University of Reading in the first place. Reading is based near big industry names and the close links and synergy between the University and these companies is very good news for students."

The Chemistry Department enjoys excellent relationships with companies looking to offer placements to students, from small companies like Alchemy Ingredients to big names such as AstraZeneca, GSK, and Unilever. We take great care to help our students to find placements that are right for them and give them the best industry learning opportunities.

Placement providers find students from Reading professional and extremely well prepared, which makes the placement attractive from their point of view, too.

Caroline Recardo, Technical Director of Alchemy Ingredients explains, "We have a long term relationship with the University of Reading, with permanent staff and placement students hailing from there. We always find that Reading students are prepared with the right skills for the project. The whole scheme really works for us – they can come in and do relevant work for us that needs doing."

“It was this industry factor that helped me choose the University of Reading in the first place. Reading is based near big industry names and the close links and synergy between the University and these companies is very good news for students.”

University of Reading

DEPARTMENT OF CHEMISTRY

BSc CHEMISTRY
WITH A YEAR IN INDUSTRY

BSc CHEMISTRY F100
BSc CHEMISTRY F106
WITH A YEAR IN INDUSTRY

Length of programmes

BSc Chemistry: 3 years full-time

BSc Chemistry with a Year in Industry: 4 years full-time

Typical A-level entry requirements

ABB-BBB including B in Chemistry, plus B in GCSE Mathematics.

Our BSc courses give you a balanced grounding in core chemistry. The first two years are common to both the BSc and MChem courses, so you can transfer to the four-year MChem course at any time before the third year (subject to academic performance).

During your studies you will have the opportunity to use our purpose-built Chemical Analysis Facility and will benefit from small-group teaching and workshops from our dedicated staff.

Students on the BSc Chemistry with a Year in Industry programme spend their third year on placement. This could be within easy travelling distance of Reading, or abroad at a multinational company, research centre or another university. On your return to Reading, you will study the third-year BSc modules and carry out a research project alongside other students and staff members. Our research covers a wide range of areas and many of our students have been named authors on internationally renowned research papers.

It is also possible to carry out your final-year project in a local secondary school, which is an excellent introduction to teaching.

YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR
• Inorganic chemistry • Organic chemistry • Physical chemistry • Practical chemistry • Skills module • Maths 1 or option 1* • Maths 2 or option 2*	• Further inorganic chemistry • Further organic chemistry • Further physical chemistry • Analytical chemistry • Skills module • Practical chemistry • Chemistry option*	• Specialist advanced topics in chemistry • Project **OR** Year in Industry	Year in Industry students: • Specialist advanced topics in chemistry • Project

*See the website for example optional modules.
Please note that all modules are subject to change.

Visit **www.reading.ac.uk/chemistry** for more information.
Ask us your questions at **www.reading.ac.uk/question**

ROYAL SOCIETY OF CHEMISTRY Accredited degree

University of Reading

DEPARTMENT OF CHEMISTRY

MChem CHEMISTRY
MChem CHEMISTRY
WITH A YEAR IN INDUSTRY

MChem CHEMISTRY F103
MChem CHEMISTRY F105
WITH A YEAR IN INDUSTRY/RESEARCH

Length of programmes

4 years full-time

Typical A-level entry requirements

AAB-ABB including B in Chemistry, plus B in GCSE Mathematics.

Our MChem courses provide a thorough grounding in core chemistry together with the skills required for a career in chemistry. During your studies you will have the opportunity to use our purpose-built Chemical Analysis Facility and will benefit from small-group teaching and workshops from our dedicated staff.

In your first two years you will take core chemistry modules, and as you progress you can choose from specialist options. You can choose to spend all four years of the course at the University, or you can spend your third year working in the chemical or pharmaceutical industry, or at a university abroad. MChem with a Year in Industry/Research students cover the core third-year material by distance-learning, and although you will be away from the University you will still receive plenty of support. On your return to Reading you will study modules in specialised fourth-year options and undertake an extended research project alongside other MChem students and staff members. Our research covers a wide range of areas and many of our students have been named authors on internationally renowned research papers.

YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR
• Inorganic chemistry • Organic chemistry • Physical chemistry • Practical chemistry • Skills module • Maths 1 or option 1* • Maths 2 or option 2*	• Further inorganic chemistry • Further organic chemistry • Further physical chemistry • Analytical chemistry • Skills module • Practical chemistry • Chemistry option*	• Advanced inorganic chemistry • Advanced organic chemistry • Advanced physical chemistry • Advanced chemistry • Research in practice • Practical chemistry **OR** Year in Industry or Research, with distance-learning	• Extended research project • Master's level topic options including: Current topics in chemical research* Advanced analytical techniques* Advanced inorganic materials* Biophysical chemistry*

*See the website for example optional modules.
Please note that all modules are subject to change.

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Ask us your questions at **www.reading.ac.uk/question**

ROYAL SOCIETY OF CHEMISTRY Accredited degree

University of Reading

DEPARTMENT OF CHEMISTRY

BSc CHEMISTRY VIA THE OPEN UNIVERSITY

(OPEN PLUS)

BSc CHEMISTRY VIA THE OPEN UNIVERSITY (OPENPLUS)

Length of programmes

4 or 5 years, depending on your previous experience (2 or 3 years part-time, 2 years full-time)

Prerequisites

All students are considered on a case-by-case basis by the Open University. If you complete your 2 or 3 years to a satisfactory level, you then progress to study at Reading.

The 'OpenPlus' entry route allows students with an active interest in chemistry to take a more flexible route into higher education. Are you looking for a change of career or to gain an additional qualification? This scheme offers you the opportunity to study a BSc Chemistry degree from the University of Reading in a more flexible, cost effective way.

In the first two or three years (depending on your previous experience), you will study with the Open University (OU) by distance-learning and benefit from the OU's excellent course materials, tutor support, seminars and practical courses. Successful completion of your studies allows entry into the second year of the BSc Chemistry course at Reading.

Your final two years are spent in full-time study at Reading covering core and optional modules. Much of your final year is spent working on a research project, giving you a range of transferable skills, which are highly valued by today's employers.

Example Course Structure

YEARS ONE & TWO	YEAR THREE	YEAR FOUR
• Questions in science • Science: concepts and practice • Laboratory skills for science • Chemistry: essential concepts • Laboratory skills for chemistry Selection of these modules is dependent on experience. Please visit **www.open.ac.uk/choose/openplus/about-ou-study/chemistry** for more information.	• Further inorganic chemistry • Further organic chemistry • Further physical chemistry • Analytical chemistry • Concepts in chemistry • Practical chemistry • Chemistry option* Medicinal chemistry or Environmental chemistry	• Choice of specialist advanced topics in chemistry • Project

*Please note that all modules are subject to change.

Visit **www.reading.ac.uk/chemistry** for more information.
Ask us your questions at **www.reading.ac.uk/question**

ROYAL SOCIETY OF CHEMISTRY Accredited degree

University of Reading

DEPARTMENT OF CHEMISTRY

BSc PHARMACUETICAL CHEMISTRY

BSc PHARMACUETICAL CHEMISTRY

WITH A YEAR IN INDUSTRY OR RESEARCH

BSc PHARMACEUTICAL CHEMISTRY F108

BSc PHARMACEUTICAL CHEMISTRY F109

WITH A YEAR IN INDUSTRY OR RESEARCH

Length of programmes

BSc Pharmaceutical Chemistry: 3 years full-time

BSc Pharmaceutical Chemistry with a Year in Industry or Research: 4 years full-time

Typical A-level entry requirements

ABB-BBB including B in Chemistry and B (or 6) in GCSE Mathematics.

This programme has been developed together with our industrial partners to produce high quality graduates for the pharmaceutical industry, an area that already employs 67,000 people in the UK and contributes £30.4bn to the national economy per year.

It will provide you with strong grounding in basic chemistry and biology, but also covers advanced topics relevant to modern pharmaceutical chemistry. The course covers the application of those skills into areas of pharmacy (metals in medicine, dosage and formulation), pharmacology and toxicity, analytical science and regulatory requirements.

You will be taught by internationally-leading experts via lectures, practical classes, workshops and tutorials. As well as benefitting from hands-on, practical experience in our cutting-edge laboratories and purpose-built Chemical Analysis Facility, you will have access to our new £55 million Health & Life Sciences building and pharmaceutical laboratories.

For those wishing to take a year in industry, we have many links with pharmaceutical companies based in the Thames Valley and beyond, including AstraZeneca, GlaxoSmithKline, Pfizer and Procter & Gamble.

YEAR ONE	YEAR TWO	YEAR THREE
• Shape, structure and reactivity in organic chemistry • Metabolic biochemistry • Building blocks of life • Inorganic chemistry for biological sciences • Physical chemistry for biological sciences • Practical chemistry for pharmaceutical chemistry • Chemical concepts and skills • Maths 1 or option 1* • Maths 2 or option 2*	• Further organic chemistry • Medicinal chemistry for chemists • Analytical chemistry • Chemical concepts and skills 2 • Metals in medicine • Advanced practical chemistry for pharmaceutical chemistry • Chemical biology • Pharmacology and toxicology • Protein structure and function	• Chemistry project • Advanced organic chemistry - synthesis of complex targets • Advanced organic chemistry - contemporary synthetic methodology • Advanced analytical chemistry for the pharmaceutical industry • Topics in pharmaceutical chemistry • Pharmaceutical case studies **OR** Year in Industry

YEAR FOUR

Year in Industry students undertake the Year Three modules in their fourth year.

*See the website for example optional modules.
Please note that all modules are subject to change.

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Ask us your questions at **www.reading.ac.uk/question**

University of Reading

DEPARTMENT OF CHEMISTRY

BSc CHEMISTRY WITH COSMETIC SCIENCE

BSc CHEMISTRY WITH COSMETIC SCIENCE

WITH A YEAR IN INDUSTRY

BSc CHEMISTRY WITH COSMETIC SCIENCE F111

BSc CHEMISTRY WITH COSMETIC SCIENCE F112

WITH A YEAR IN INDUSTRY

Length of programmes

Without industry year: 3 years full-time

With year in industry: 4 years full-time

Typical A-level entry requirements

ABB-BBB with a B in Chemistry. At least 6 in GCSE maths and 4 in GCSE English.

This exciting, dynamic programme utilises the academic expertise within Chemistry, Food, Pharmacy and Biological Sciences, as well as our industrial partners. The University of Reading has strong links with multinational and local organisations such as Unilever, Tropic Skincare and Alchemy Ingredients.

The cosmetics industry is booming: the UK market was worth £9,379m in 2017 and was one of the top five largest markets in the EU.[•] This rapid expansion has caused a skills-shortage of chemists looking to work with cosmetics development.

We have developed this specialised degree as a result of extensive consultation with our students and industry. Core chemistry modules are combined with cosmetic science modules, such as the biology of skin and hair, the chemistry of waxes and oils, formulation, and launching a product.*

You will be taught via lectures, tutorials, practical classes and workshops, and in your third year, you have the opportunity to undertake a placement in the cosmetics industry. In your final year, you will put into practice everything you've learned during your course as part of a new product development project. You could be tasked with developing an innovative cosmetic product, or reformulating a current product from one of our industry partners. You will learn the same processes as those used in industry, with input from industry professionals, making you extremely employable in a rapidly expanding cosmetics market.

YEAR ONE	YEAR TWO	OPTIONAL YEAR IN INDUSTRY	YEAR THREE/FOUR
• Organic chemistry • Inorganic chemistry • Physical chemistry • Practical chemistry • Skills module • Maths or an option • Building blocks of life	• Further organic chemistry • Further inorganic chemistry • Further physical chemistry • Practical chemistry • Analytical chemistry • Core cosmetic science • Chemical concepts and skills		• Further cosmetic science • Launching a product • Project • Advanced organic chemistry • d and f-block chemistry • Advanced physical chemistry • Options within chemistry

*Please note that all modules are subject to change.

•Cosmetic, Toiletry & Perfumery Association website, December 2018

Visit **www.reading.ac.uk/chemistry** for more information.
Ask us your questions at **www.reading.ac.uk/question**

Disclaimer
This brochure was issued in 2018 and is aimed at prospective undergraduate students wishing to apply for a place at the University of Reading (the University) and start a course in autumn 2019.

The brochure describes in outline the courses and services offered by the Department of Chemistry at the University. The University makes every effort to ensure that the information provided in the brochure is accurate and up-to-date at the time of going to press (August 2018). However, it may be necessary for the University to make some changes to the information presented in the brochure following publication – for example, where it is necessary to reflect changes in practice or theory in an academic subject as a result of emerging research; or if an accrediting body requires certain course content to be added or removed. To make an informed and up-to-date decision, we recommend that you check **www.reading.ac.uk/Ready-to-Study** for up-to-date information.

The University undertakes to take all reasonable steps to provide the services (including the courses) described in this brochure. It does not, however, guarantee the provision of such services. Should industrial action or circumstances beyond the control of the University interfere with its ability to provide the services, the University undertakes to use all reasonable steps to minimise any disruption to the services.

Year abroad and placement fees
Some courses include an optional or compulsory year abroad or placement year. During this year you will only pay a partial fee which is currently set at 15% of the normal tuition fee. Check the website for the latest information: **www.reading.ac.uk/fees-and-funding**

The partnerships listed are correct at the time of publication (August 2018). For up-to-date information on the University's partnerships contact **studyabroad@reading.ac.uk**

Where Study Abroad is not a compulsory part of the degree programme, the University of Reading cannot guarantee that every applicant who applies for the scheme will be successful.

Whilst efforts are made to secure sufficient places at partner institutions, the number of places available and the University's partners can vary year-on-year. In all cases, the University cannot guarantee that it will be possible for applicants to choose to study abroad at a particular institution. Further, certain courses and/or institutions may require you to satisfy specific eligibility criteria. It can be a competitive process.

For further information on the University's Study Abroad Scheme please contact **studyabroad@reading.ac.uk**

University of Reading

Department of Chemistry
www.reading.ac.uk/chemistry

Ask us a question
www.reading.ac.uk/question

Athena SWAN Bronze Award