

MANCHESTER
1824

The University of Manchester

Chemistry



One of Britain's largest schools of Chemistry, with top ratings for both teaching and research

83% of our 2014/15 graduates were recorded as being in a graduate level job or further study within 6 months of leaving their course

Proud history since 1825, with seven chemistry Nobel prize winners

Placed in the top four universities in the UK in the 2015 QS World Rankings for chemistry

The facts

93%

2015 student satisfaction (NSS, Unistats)

UNIVERSITY OF MANCHESTER



Manchester chemistry leads the way in delivering a world-class education using cutting edge facilities, with courses delivered by world-leading experts. Our graduates follow careers in almost every industrial sector, in areas as varied as industrial biotechnology, nuclear clean-up, nanotechnologies as well as the traditional chemical and pharmaceutical industries. ”

Professor Richard Winpenny



Head of the School
of Chemistry

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The University of Manchester

Making things happen

Influential, forward-thinking and down-to-earth, we'll give you an amazing university experience rooted in a rich academic heritage. We turn enthusiasm into achievement and ground-breaking theory into innovative practice.

We accomplish feats of global significance, from splitting the atom, to giving the world graphene—the two-dimensional wonder material that is one atom thick, but 200 times stronger than steel.

With more Nobel laureates on our staff than any other UK university, and strong links to industry and public services, we vitalise our undergraduate courses with pioneering research.

Learn more about us:
www.manchester.ac.uk

Manchester



Our city

Always moving forward

Manchester thrives on innovation and creativity, always a step ahead in science, industry, media, sport and the arts. The Mancunian character—exemplified by the city's central role in the Industrial Revolution—stands for excellence and originality in all walks of life.

All corners of the world meet in Manchester. It is a cosmopolitan magnet for students and professionals who are eager to experience our can-do attitude, independent spirit and cultural wealth.

Never content to live on past glories, Manchester has a passion for progress. Join us at the heart of Britain's most popular student city.

Discover what makes Manchester unique:
www.manchester.ac.uk/city

Your experience

More than just a degree

Whether you prefer to work in the ultra-modern surroundings of the Alan Gilbert Learning Commons, or if you get your inspiration from the neo-gothic grandeur of the John Rylands Library, we've got it covered with our impressive range of flexible study environments and support services for a truly personal learning experience.

And that's not all. Outstanding sport facilities, over 450 student societies, supported community volunteering, study abroad pathways, career development programmes and mentoring are all ways in which we support you to grow and develop outside the lecture hall.

Make the most of what we have to offer and you'll enjoy a well-rounded university experience that prepares you for life after graduation.

Hear from some of our students:
www.manchester.ac.uk/study/experience

Your future

On a course to success

We are one of the UK's most targeted universities by employers, thanks to courses and careers services designed with your employability in mind.

Our problem-based approach to learning inspires you to think critically, creatively and independently. Taking part in activities to enhance your academic record, such as volunteering, personal development and interdisciplinary learning can give you a broad perspective and a competitive edge, shaping you into a socially responsible leader of tomorrow.

Our award-winning careers service provides a wealth of tools, advice and development opportunities, and connects you with employers to put you a step ahead on the path to success.

Take control of your career:
www.manchester.ac.uk/careers



Chemistry at Manchester

“ One of the most enjoyable parts of the course is that I am taught by outstanding lecturers who are willing to help and who are recognised scholars in their field of study. I am in one of the largest Schools of chemistry with many students from different cultures and countries sharing the same passion for chemistry. ”

Iaroslav Kosov

third-year student
BSc (Hons) Chemistry with
Medicinal Chemistry

Engineering and Physical Sciences
International Excellence
Scholarship recipient, 2014



Modern chemistry takes you into all areas of modern science: from physics to biology, mathematics and materials science. Whether looking at fundamental reactions in living cells, the processes occurring in interstellar space, nanotechnology and quantum dots, or DNA and the human genome – chemistry is at the heart of it. Both practically (in the laboratory) and computationally, chemists probe the fundamental processes happening at a molecular level.



Dr Patrick O'Malley
National teaching award

Dr Patrick O'Malley, Reader in Physical Chemistry, has won the Royal Society of Chemistry's Higher Education Teaching Award 2015 for his pioneering technological innovation in chemistry teaching. Patrick is a Fellow of the Royal Society of Chemistry and has taught physical chemistry at undergraduate level for more than 20 years and has published a large number of articles on pedagogical innovations. He is a keen proponent of technology enhanced teaching methods and is the Faculty of Science and Engineering's academic lead for eLearning and took a leading role in the first UK chemistry MOOC featuring fully interactive screencasts and virtual laboratories. He received a University of Manchester Teaching Excellence award in 2010 and won the 2015 Guardian Higher Education award in the online/distance learning category. He is a keen proponent of excellent chemistry teaching at universities. Patrick's research interests are in biophysical chemistry, especially the electron transfer reactions involved in Photosynthesis. He is an international leader in this area and has published more than 150 research papers and presented at numerous international conferences.

The ability of chemists to manipulate atoms and molecules into complex shapes gives chemistry an artistic aspect almost unique among the sciences. This is chemistry today: a cornerstone of modern science.

If you are looking for a varied and interesting career, a degree in chemistry is an excellent stepping-stone to a wide variety of opportunities.

Why Manchester?

- External links with industry and internal multidisciplinary links that inform and improve our undergraduate courses
- Internationally renowned research covering the full spectrum of chemical activity, ensuring taught courses based on the latest knowledge
- A range of degrees, including options such as year-long industrial placements and study in a mainland European university (or equivalent establishment) or on a worldwide placement.

Why study Chemistry?

Chemistry can justly claim to be the foundation science of modern civilisation. We could live a tolerable life without computers, television, fast transport, microwave cookers, or nuclear power but what about surgery or dentistry without anaesthetics, or medicine without drugs? It is chemists who design and synthesise the 'miracle' drugs that we now take for granted.

Life in the school

Teaching and Learning

At Manchester, we aim to make your transition from secondary school or college to higher education as smooth as possible. Our teaching gradually encourages you to take charge of your learning in your first year, so you will become a more independent, confident student.

Our first semester, running until Christmas, has a lighter lecturing load, allowing us to introduce you to methods of learning that might be new to you, such as computer-aided learning and group-working. We will also use staff-supervised workshops and computer-aided learning material to cover topics where the underlying concepts are simple and where practice is the best learning method. You will have covered many of these topics at A-level, and our workshops will revise this material, bringing all students to the same level.

You will learn about 'communicating chemistry', where skills such as data retrieval, report writing and making effective presentations will be strengthened in a chemical context. Much of this will involve group-working tasks, such as researching the literature in a current area of chemistry.

Chemistry is a physical science, so we will also build up your quantitative skills in mathematical manipulation and data analysis pertinent to chemistry. This makes use of extensive e-learning, online testing and drop-in clinics, allowing you to proceed at your own pace using our own computer cluster. Seven hours per week are dedicated to laboratory classes, where you will be taught the basic skills required for practical chemistry.

All first-year undergraduates are given a free introductory Chemistry textbook (Chemistry 3 by Burrows et al), a laboratory coat and a molecular model kit.

Flexibility and choice

The courses at Manchester follow a core structure for the first two years (and part of the third year for four-year courses), but also allow you considerable flexibility, especially in the third (and fourth) years, including a range of outside course units.

Your first semester includes a student-centred skills course unit covering basic mathematics, using printed and web-based material. The content is carefully targeted to the requirements of the core course and you may work through it at your own pace.

The courses leave room for a subsidiary subject selected from a range of subjects, such as Biochemistry, Earth Sciences, Materials, Mathematics, Physics, a European language, and the History of Science. You will also attend various skills course units, which teach a range of presentation, computer and information-retrieval, and report-writing skills.

We offer you the widest practicable choice of third-year course units. You will be required to take core Chemistry units, but will also have the opportunity to select from a range of other units. These include advanced Inorganic, Organic and Physical Chemistry, as well as ones that cut across the traditional divisions, such as Bioinorganic Chemistry and Environmental Chemistry.

There is also an opportunity to take an optional course from outside chemistry, through the University College for Interdisciplinary Learning or the Manchester Leadership Programme.

Professional accreditation

Whether you stay on at the University or not, our graduates are eligible for membership of The Royal Society of Chemistry (RSC) – the professional society for chemists in Britain.

At BSc level, bachelor accreditation gives you access to qualified membership of the RSC, and forms the basis for satisfying the academic requirements for achieving Chartered Chemist (CChem) through further study or continued professional development.

Graduation at the MChem level with First or Second Class Honours provides you with access to qualified membership of the RSC, and fully satisfies the academic requirements for award of Chartered Chemist (CChem) status.



Emily Parkes
BSc (Hons) Chemistry
Team Leader and Scientist, TEVA Runcorn

What is your current role and your main responsibilities?

New Product Introduction Technologist at Teva Runcorn (international pharmaceuticals company, based in Israel). I manage the technical development and validation of manufacturing schemes for new pharmaceutical products.

Please summarise your overall career since graduation, but in particular, what was your first relevant role to the area in which you work now and how did you secure that position?

Immediately post-graduation I started as a temp scientist at Sanofi Aventis in Holmes Chapel; I applied via SRG after seeing an advert in New Scientist. This temp job led to a permanent job with SRG as a Synergy Scientist (up until this point my main focus was analytical science/laboratory testing). The product I was working on at Sanofi Aventis was abandoned so I was made redundant after two years; I immediately then got an R&D laboratory job at Teva. Moving into R&D was great for me... lots of scope to use my degree and progress into a formulation/pilot scale manufacturing development role that then led to my current role.

How has your qualification helped you in your career?

A science degree is essential for anyone hoping to work in the pharma industry; I wouldn't be where I am without my degree. I am hoping to apply for a distance-learning Masters degree in pharmaceutical science in the near future in order to further my career and reach my goals; in order to complete this type of course it is essential to have a good science degree under your belt.

What is your greatest achievement to date?

I achieved a first class degree from Manchester Uni; an achievement I'm proud of. Post university, I have become a member of the RSC. I received praise and recognition from senior management at Teva Runcorn for successfully project managing the

development, validation and submission of a new ophthalmic product that is tipped to be the next 'blockbuster' product for the site, under incredibly tight timelines and significant pressure.

What advice would you give to someone thinking of pursuing a similar career route and what skills/experience do you consider to be necessary?

I would say that drive, ambition and intelligence can take someone far, however, also important for real success is the ability to learn from others, ask questions rather than guess and development of soft skills, i.e. how to work with others/in a team, how to influence people etc. A good science degree is essential. The most important recommendation I can give is to do a year in industry (i.e. sandwich placement) if at all possible; I originally applied for a sandwich course but dropped into a BSc as I wanted to graduate and get into work earlier; I have always regretted this decision as it is such a good chance to get a feel for what working in industry is really like and gives those students such a headstart for when they graduate!

What did you most enjoy about your time at Manchester?

I love the city; I still live in the centre even though my commute to Runcorn is lengthy. The Chemistry department at Manchester is one of the best in the country; I had all the support I needed from excellent tutors/lecturers etc.

Why would you recommend the University as a good place to study?

Manchester is a student-friendly city, there is so much going on here, music, culture, shops, sports. The main campus is right in the centre of everything on Oxford Road and the halls are all nearby. Uni facilities are excellent and academic support is easily accessible to all.

Chemistry at Manchester

Facilities

To help you make the most of your time at the University, we have available for our students:

- Dedicated computer cluster, used as an integral part of teaching
- £14.1 million teaching laboratories
- Regular small-group teaching in tutorials
- State-of-the-art synthetic labs for project work
- Electronic online access to scientific journals for study and project work

Student support

While the size of our School is important for the enhanced facilities and opportunities it brings, we are also very aware of the need for the personal touch.

We take excellent care of our students and assign several tutors to oversee the process. As well as the Director of Undergraduate Studies in overall charge, all students have three academic tutors in Physical, Inorganic and Organic Chemistry. You will also have your own personal tutor to oversee your personal welfare; each member of staff has a small number of personal tutees per year.

Employability and careers

Our students are highly sought after in the graduate market because they are skilled in scientific methodology, highly analytical and are versatile problem solvers. Last year our graduate destination data indicated that 83% of our 2014/15 graduates were recorded as being in a graduate level job or further study within 6 months of leaving their course. Of these around half gained their first job directly using their chemical knowledge; 25% went onto a further degree; and the remaining 25% opted for diverse careers in such areas as finance, management, computing and IT.

It's a promising time to get a degree in chemistry. The British chemical industry, the sixth largest in the world, is the UK's number one export earner. It is the largest UK manufacturing sector, with a turnover exceeding £50 billion, employing around 200,000 people. Graduates in chemistry form the essential nucleus that will keep it at the forefront of industry. International career prospects are also excellent as the industry continues to grow.

The University of Manchester currently tops the list of the annual poll of employers' preferred sources of graduates, outperforming all other UK universities, making us the most targeted university in the UK by employers. Our School works closely with the University's Careers Service to help you gain further skills to complement your degree, and to explore the job market. This includes having a dedicated Careers Consultant, giving our students regular opportunities for one-to-one careers guidance and applications advice, as well as timetabled skills-boosting careers workshops.

Our students also have many opportunities to meet and learn from industry experts. The School offers students opportunities across each semester to meet with employers at panel and networking events, whilst our Manchester Gold Mentoring programme, which has been running for over ten years, allows students to be paired with an industry professional for a period of six months. During this time students can set objectives such as developing their skills or getting an insight into different roles within a sector. Our Industrial Experience course also presents a fantastic opportunity for students to gain hands-on experience of working in industry, with the School having strong links with over 60 of the major chemicals companies in the UK.

If you are looking for a university with a world-class reputation for teaching and research, which is better respected by employers than any other, come and visit us to see that Manchester is the right choice for you.



Stewart Clarke
BSc (Hons) Chemistry
Consultant Project Manager, Freelance Project Management and IP Consulting, Heritage/Environmental Services

What is your current role and your main responsibilities?

My official title is "Project Manager Legal" in a bicycle company that manufactures and distributes three well-known brands worldwide. I effectively run the IP holdings of the company and have two key roles in product development, the first is when we are licensing technologies and the other is when we're developing new proprietary.

Please summarise your overall career since graduation, but in particular, what was your first relevant role to the area in which you work now and how did you secure that position?

After graduating I wanted to travel and do something fulfilling in the real world so trained as an ESL teacher and got a one-way flight to Indonesia; there I taught in a variety of schools to a variety of students while saving up money to travel. I taught/travelled for a few years before settling in Taiwan and landed a job as an editor in a patent law firm. I was trained by the firm to write and edit patents as well as proof-read all commercial correspondence. After three years and completing a postgraduate certificate in IP, I was the senior editor responsible for all commercial correspondence as well as the "commercial voice" of the company and worked with a team of over 20 engineers/scientists in four cities. After four years of working in the law firm I moved to my current job where I have built upon and developed my IP skills further and am now doing a graduate law conversion course to assist my understanding of contract law.

How has your qualification helped you in your career?

Without a degree I could not have obtained a visa to teach ESL overseas as an undergraduate degree is the first requirement in each country where I have taught. Then, when recruited by the law firm and indeed to work in IP you need a technical

degree so again without this I would not have been able to take the job or be accepted on training schemes. More importantly, the training I received at university helped me to communicate difficult technical concepts clearly, which is essentially all a patent is, so has been the foundation of my entire career.

What is your greatest achievement to date?

I have been listed as the inventor on two different patents and assisted in the development of countless other technologies, but the most impressive achievement has been working in this team to bring the world leading folding bicycle to market.

What advice would you give to someone thinking of pursuing a similar career route and what skills/experience do you consider to be necessary?

I don't think that when you set out working towards a career that you ever know what the exact result of each step will be or what you will learn. Therefore, I would recommend two things; firstly, stay flexible and be willing to adapt to any new challenge that may present itself, and secondly, always be willing to learn. I have spent the last four years doing postgraduate study in my spare time and it has helped my work directly as well as giving more power to my work experience.

What did you most enjoy about your time at Manchester?

I really enjoyed the times between classes hanging out with other chemistry students. We would sit in our favourite cafe and work through any issues we were having with our studies or personal lives or just chill between lectures and have some fun.

Why would you recommend the University as a good place to study?

I believe that Manchester University gives a real-world focused education to its graduates so they gain the ability to thrive in industry.

Chemistry at Manchester

Visit days

Promising applicants will be invited to attend one of our visit days, which are held regularly between November and March. Starting with registration and a buffet lunch, these days give you the opportunity to see our School and campus at first hand, to ask questions, and to meet members of staff and current students. You will also have an informal 30-minute interview with a member of staff. The day is rounded off with a 40-minute 'flash bang' show. This will help us determine the most appropriate offer for you.

Your parents can also attend the visit day, and we arrange a separate programme for them.

Scholarships

The School has a range of scholarships available – visit www.chemistry.manchester.ac.uk/study/undergraduate/scholarships for details.

As one of the country's leading centres of research and learning, our University is committed to attracting and supporting the very best students. If you have the talent and ability, we want to make sure that you have the opportunity to study here regardless of your financial circumstances. More than one-third of our students will receive bursaries of up to £3,000 per year and many will be offered even more generous support.

Peer Assisted Study Scheme (PASS)

We are also proud of our innovative PASS (Peer-Assisted Study Sessions) scheme. The PASS scheme has one voluntary session each week that provides additional support in the area of that week's tutorial. In the session, third and fourth-year students help first-years to tackle problems similar to those in the tutorial. The emphasis is on showing you how to think about the problems and develop problem-solving skills, and how to get the most from our educational resources. Students who attend PASS tend to get better exam results. A recent PASS student commented, "PASS was a massive help with my first year studies".

ChemSoc

Our student-run course society, ChemSoc, is the social side to chemistry at The University of Manchester. For students with 'traditional' tastes, there's our infamous lab coat pub crawl and the annual Chemistry Spring Ball, alongside socials where we team up with other course societies – shapes will be thrown, dignity may be challenged! On the academic side of things, however, ChemSoc works with faculty and the RSC to offer talks from visiting lecturers on a wide variety of chemical topics. Chemistry also has successful netball and mixed hockey teams, comprising freshers to final year PhD students, competing in the campus league. We aim to make your time in the School as enjoyable as possible, across the board. To keep up with everything we have going on, find us on Facebook at **UoM ChemSoc**.

Will Dawson, ChemSoc President 2015/16

Staff-Student Liaison Committee (SSLC)

We encourage our students to work with us to improve the quality of our teaching and degree programmes. Each year group votes for two student representatives, who are responsible for bringing forward student issues to our Staff-Student Liaison Committee. We also encourage regular feedback through our teaching surveys, and all students are encouraged to put forward comments and suggestions to their personal or course tutors, programme directors or other teaching staff. Being a student representative is a great way to get to know other students on your course, as well as gaining experience which looks great on a CV. Reps are supported through our Student Experience Officer and Students' Union.





Lucy Roberts
second-year student
MChem (Hons) Chemistry with Industrial Experience

Why did you choose your course?

I chose Chemistry because it qualifies you for many jobs by boosting your key skills as well as giving you an in-depth knowledge of Chemistry. Also because there is a lot of flexibility with Chemistry, for example there are many different modules you can choose aside from the core course. Finally, because I really like the idea of a year in industry as it will be a break from ordinary university life and a chance to further your learning, as well as earn money.

What A Levels did you study?

Maths, Chemistry and Biology.

Why did you choose The University of Manchester?

On the Open Day I really enjoyed the atmosphere in the department, it's light and welcoming. I also chose to study at Manchester because of the style in which the course is taught; there are a lot of contact hours and extra help is easily available, for example through PASS schemes and tutors.

What is the best thing about The University of Manchester? (e.g. accommodation, teaching, community etc)

I think it's the community at Manchester; the Chemistry course is very sociable as you meet many different groups of people, for example in tutorials or in your lab bay. Furthermore, there is a huge students union which gives you a chance to get involved in extracurricular activities.

Are you involved in any clubs or societies, and if so what are they?

I am a part of the Chemistry society. I hope to join Chemistry netball and the surf club next year.

What is student life in Manchester like?

Great fun and fast paced. There are lots of things to see in Manchester and something is always happening in Fallowfield.

Are you preparing to spend, or have you already spent a year in industry or a year abroad? What support are you receiving / did you receive with this? What did you gain from your year out?

I am planning to spend a year in industry in my third year. There have been lectures helping us with how to better our CV this summer and therefore have a better chance at getting a placement. Also, the Careers' Service leader for this scheme sends emails or opportunities available and is very easy to get hold of and helps to supply additional support for placements you have received.

What advice would you give to someone thinking of applying to The University of Manchester?

Come and visit or chat to someone already here so you can get a proper feel for the University.

Course details

Chemistry
BSc 3yrs
UCAS Code F100

Chemistry with Medicinal Chemistry
BSc 3yrs
UCAS Code F150

Chemistry MChem 4yrs
UCAS Code F109

Chemistry with Industrial Experience
MChem 4yrs
UCAS Code F101

Chemistry with Medicinal Chemistry
MChem 4yrs
UCAS Code F152

Chemistry with International Study
MChem 4yrs
UCAS Code F104



Typical offer

A-level AAA - AAB
IB 36 - 35 points

If you miss the MChem grades (AAA), but meet the BSc grades (AAB), you will automatically be offered a place for BSc Chemistry.

For full details of our entry requirements, visit:
www.chemistry.manchester.ac.uk/study/undergraduate/courses

BSc (Hons) Chemistry (F100)

MChem (Hons) Chemistry (F109)

Years 1 and 2

For information on the first two years, see 'Flexibility and choice', page 8.

At the end of your second year, you can choose whether to study for a three-year BSc (Hons) Chemistry degree, or the four-year MChem (Hons) Chemistry course. Your eligibility for continuation on the MChem course is assessed at the end of each year and is at the discretion of the School of Chemistry. The assessment is based on your general performance and end-of-year mark. If you have not reached the minimum threshold required for MChem, then you will be transferred to the BSc (Hons) Chemistry course. However, most of our students are eligible to continue their training through the master's year.

Year 3: BSc Chemistry (final year)

You can choose from a wide range of course units made up of core, advanced Chemistry and subsidiary units. These include advanced course units in Inorganic Chemistry, Organic Chemistry and Physical Chemistry, as well as topics that cut across the traditional divisions (eg, Environmental Chemistry and Bioinorganic Chemistry).

As alternatives to the Chemistry course units, some units are available from other courses/Schools, such as the History of Science, Technology and Medicine, and the Manchester Enterprise Centre. The 'Chemistry with' courses have specialist units provided by the partner School.

Practical work this year consists of four short projects covering synthetic chemistry, measurement, computational chemistry and literature analysis.

Year 3: MChem Chemistry

You study chemistry in greater depth and select a greater number of advanced Chemistry course units. You also undertake a group research project, which you will plan and design in collaboration with a member of academic staff.

Year 4: MChem Chemistry (final year)

You carry out an extended individual project associated with one of the research groups in our School of Chemistry. You will study course units related to the area of the project, take units from other areas of chemistry and attend specialist lectures chosen in consultation with your project supervisor.



Chemistry

MChem (Hons) Chemistry with Industrial Experience (F101)

Students on this course spend a 'sandwich' year in industry after their first two years of academic work. Sandwich students find significant advantages in the job market, where employers value their skills, experience and initiative. At least 60 companies, including most of the major chemical companies in the UK, employ our sandwich students. The work is for 12 months and is paid generously.

We have recently placed students with some of the largest firms in the country, including:

| | |
|----------------------|--------------------|
| 3M Healthcare | Amec |
| AstraZeneca | AWE |
| Bristol-Myers Squibb | British Sugar |
| Cadbury | Cancer Research UK |
| Chemtura | Cognis |
| Croda Chemicals | Domino |
| Eli Lilly | Fuji Film |
| GlaxoSmithKline | Imerys |
| Ineos | Infineum |
| Innovia Films | Intertek ASG |
| Johnson Matthey | Kellogg's |
| L'Oreal | Lubrizol |
| Novartis | Phillips66 |
| Pilkington | Reckitt Benckiser |
| Redx | Syngenta |
| Unilever | Victrex |

We have a programme director, who acts as a facilitator between you and potential employers, and provides pastoral care during your placements. You will have frequent contact with the programme director while applying for jobs and you will be visited by them or by another member of academic staff at least twice during your year in industry, to gain advice, support and assessment.

Years 1 and 2

For information on the first two years, see 'Flexibility and choice', page 8.

At the end of your second year, you can elect whether to study for a three-year BSc (Hons) Chemistry degree, the four-year MChem (Hons) Chemistry with Industrial Experience degree. However, eligibility for continuation on this MChem course is assessed at the end of each year and is at the discretion of our School of Chemistry. The assessment is based on your general performance and end-of-year mark.

Year 3

You spend this year in industry. Our programme director will maintain contact with you and will arrange for academic tutors to visit you during your placement year.

Core Chemistry material is taught by distributed learning units. You will also write a detailed report on the work that you have carried out during your placement year and you will give an oral presentation at the end of the year.

Year 4 (final year)

You will carry out an extended project associated with one of the research groups in our School. You will study course units related to the area of the project, take course units from other areas of chemistry and attend specialist lectures chosen in consultation with your project supervisor.



Jonathan Aze
second-year student
MChem (Hons) Chemistry with Industrial Experience

Why did you choose your course?

I've always enjoyed chemistry and it's pretty consistently been the subject I've performed best in. Additionally, there are a wide range of jobs available for chemists, both in the chemical industry and in the wider world of work.

I specifically chose the industrial experience course because I thought having done a year's working as a chemist as part of my degree might give me an advantage when applying for a job after I've graduated.

What A Levels did you study?

Maths, Further Maths, Physics, Chemistry

Why did you choose The University of Manchester?

I just liked the best of the universities I looked at. The large size of the University and the department gives it some unique advantages. For example, it allows undergraduate chemists to have access to equipment they wouldn't be able to in most other universities. At the Open Day I got the impression the University cared about its students and really wanted you to come there. Also, the labs and other facilities looked modern and well equipped.

What is the best thing about The University of Manchester? (e.g accommodation, teaching, community etc)

There's so much it's hard to say just one thing. The city itself is great, it's cheap to live in but there's always plenty going on. The course is really enjoyable and most of the time strikes the right balance between being challenging, interesting and informative.

Are you involved in any clubs or societies, and if so what are they?

I occasionally go on trips with the hiking society, and have done a few events with Action Palestine.

What is student life in Manchester like?

The large number of students in Manchester makes you feel like students are an important part of the city wherever you go. Manchester is such a big and diverse city there's something for everyone.

Are you preparing to spend, or have you already spent a year in industry or a year abroad? What support are you receiving / did you receive with this? What did you gain from your year out?

Next year I will do a year's industrial placement at Sellafield, the site of Britain's first nuclear power station. The chemistry department offer loads of support for anyone applying for industrial placements. They have a list online of everywhere that is advertising for placement students, which is frequently updated. The Careers' Service leader for this scheme will read through your covering letter and CV and offer helpful suggestions for improvements if you email it to her. Practice interviews are also part of the course.

What advice would you give to someone thinking of applying to The University of Manchester?

Make sure you enjoy yourself in your first year. Make an effort to try something new while you're here.

Chemistry

MChem (Hons) Chemistry with International Study (F104)

This Honours degree gives you the opportunity to spend year 3 studying chemistry in a European university under the ERASMUS programme (France, Germany, Spain or Italy) or in a North American University (USA or Canada) or at Nanyang Technological University, Singapore.

The programme director and Study Abroad Unit will be in e-mail contact with you during your stay to provide help and support when necessary.

Assessment for International Study (Europe) involves courses and practicals in the host institution and a final report on the year out. Assessment by the North American university involves coursework, laboratory classes and examinations.

Since the total Chemistry content will be at least equivalent to that of our existing courses, this degree satisfies the requirements for professional recognition by the RSC.

You will take the extramural year (around nine months in practice) after your second year at Manchester. You choose which of our partner universities to attend:

In Europe:

- Valencia, Spain
- Göttingen or Freiburg, Germany
- ENSCM, Montpellier or Strasbourg, France
- Florence, Italy.

Worldwide:

- Arizona State University
- University of California
- University of Illinois, Urbana-Champaign
- University of Missouri, Columbia
- University of Tennessee, Knoxville
- University of Massachusetts, Amherst
- University of North Carolina, Chapel Hill
- Rutgers, New Jersey
- University of Vancouver, British Columbia
- Queens University, Ontario
- McGill University, Montreal
- Nanyang Technological University, Singapore.

(Please note: these locations are subject to change).

For your year abroad, you are aided in the choice of the course units you take while there and will receive help in the arrangement of your accommodation, etc. Essentially, you become a local student for the time you are there.



Years 1 and 2

For information on the first two years, see 'Flexibility and choice', page 8.

At the end of your second year, you can choose whether to study for a three-year BSc (Hons) Chemistry degree, the four-year MChem (Hons) Chemistry degree, or the MChem (Hons) Chemistry with International Study degree. However, your eligibility for continuation on this MChem course is assessed at the end of each year and is at the discretion of our School of Chemistry. The assessment is based on your general performance, formal interview in your second year and end-of-year marks in both the first and second years.

Those students progressing onto European destinations in year 3 must have demonstrated a proficiency in the language of the host university (minimum grade A at GCSE level at entry) and are required to attend a Language Experience for All Programme (LEAP) in Manchester during their first and second years.



Manchester is a fantastic place to live and study. The city has become a 'home away from home' and with so much to do I have loved every minute of living here. Chemistry at Manchester is brilliant, the lectures are inspiring and there is tonnes of help from the staff. Manchester also offered me the chance to study abroad in my third year. This will be an invaluable experience, giving me the chance to travel, learn and make friends from around the world, all as part of my degree.



**Bethany Rodd, third-year student
MChem (Hons) Chemistry with
International Study**



Chemistry

Year 3

Your placement will be spent in a university outside of the UK. We link with a range of universities in Spain, Germany, France, Italy, North America and the Far East (via the ERASMUS and Worldwide Universities Schemes). Our host universities have been carefully selected on the basis of their track record of academic excellence and their support of cultural exchanges, and they share our own aspirations for the continued all-round development of the student. Your tutor/director keeps in touch with you, and you may be visited whenever possible. You are assessed entirely via the marks obtained from your host university.

Our Study Abroad Unit offers information about the financial aspects of your year abroad and links to partner universities' web pages.

Year 4 (final year)

You carry out an extended project associated with one of the research groups in our School of Chemistry. You will study course units related to the area of the project, take course units from other areas of chemistry and attend specialist lectures chosen in consultation with your project supervisor.

BSc (Hons) Chemistry with Medicinal Chemistry (F150)

MChem (Hons) Chemistry with Medicinal Chemistry (F152)

Medicinal chemists contribute to the design, discovery and development of new drugs, to finding out what happens to drugs in the body and to modifying drugs to make them more effective. Natural extracts have been employed as medicines over several millennia (herbal remedies dating back to over 3000 BC have been recorded in China).

In modern times, we are increasingly able to understand the causes of diseases at the molecular level. Rapid advances in biomedical understanding and technologies ensure that medicinal chemistry is central to the discovery and development of new drugs. Exciting developments in analytical technologies and nanochemistry also offer future prospects to understand drug actions, and design new ways for enhancing drug effects. Drug discovery is one of the main contributors to the dramatic impact on health and wellbeing seen particularly in the developed world over relatively few generations.

Of course, there is still much to do. In the developed world, diseases of ageing are key targets for study, with cancer also a major area for molecular understanding-led drug developments of the future. Medicinal chemistry is also key to challenging viral diseases, including virulent flu strains and other widespread viral diseases such as hepatitis C and also to the growing challenges of antibiotic resistance. In the developing world, malaria and HIV-1 remain all too prevalent. Medicinal chemistry increasingly brings together advances in the chemical understanding of biology, powerful technologies for analysis and for modelling, to the design of new methods to make drugs including new biotechnologies, and new ways to help accelerate discovery of new generations of drugs. Perhaps more than in any other area, medicinal chemists are able to make a significant impact on the lives of the wider community.

Our Medicinal Chemistry course is delivered by lecturers from our School of Chemistry, the School of Pharmacy and Pharmaceutical Sciences, the Paterson Institute for Cancer Research, AstraZeneca and the NHS.



Year 1

You attend core chemistry lectures and course units on biochemistry and medicinal chemistry.

Year 2

You continue to develop the core chemistry; in addition, you take course units on the fundamentals of drug discovery and the 'big killer' diseases.

Year 3: BSc Chemistry with Medicinal Chemistry (final year)

Alongside core chemistry units, you take advanced Chemistry course units in various aspects of medicinal chemistry and bio-organic chemistry, and units on advanced drug discovery and synthesis for drug discovery and development. Practical work in the third-year consists of four short projects covering synthetic chemistry, measurement, computational chemistry and literature analysis.

Year 3: MChem Chemistry with Medicinal Chemistry

Alongside core Chemistry units, you will take advanced course units in various aspects of medicinal chemistry and bio-organic chemistry and units on advanced drug discovery and synthesis for drug discovery and development. Practical work in the third year consists of a group research project, which you will plan and design in collaboration with a member of academic staff.

Year 4: MChem Chemistry with Medicinal Chemistry (final year)

You carry out an extended project in Organic/Biological/Medicinal Chemistry (within the School/Manchester Interdisciplinary Biocentre, in the labs of the research group supervising the project).

You study course units from various areas of chemistry, biological chemistry and medicinal chemistry, including optional course units from the School of Pharmacy and Pharmaceutical Sciences, and may attend specialist lectures chosen in consultation with your project supervisor.





Our research

Manchester Chemistry has an international reputation for innovative, cutting-edge research. The School has world-class capabilities in synthesis, materials chemistry, biological chemistry, radiation and radiochemistry, and analytical chemistry and spectroscopy. We develop innovative methods to help tackle major challenges related to life and health, energy and the environment, sustainability and new technologies. As an undergraduate at Manchester, you will have the opportunity to experience research at the boundaries of knowledge, and to contribute to the development of an exciting and vibrant subject.

To find out about our research go to www.chemistry.manchester.ac.uk/our-research

Recent Awards

Professor Paul O'Brien awarded CBE

Professor Paul O'Brien has been awarded a CBE in the New Year's Honours List for services to science and engineering. In particular, it recognises the extraordinary work he has pursued developing chemistry in Africa. Professor O'Brien's research centres on developing new chemical processes for thin films and nanoparticles; especially of chalcogenide containing materials. In 2002 he founded Nanoco, an AIM listed company that manufactures nanoparticles. He has published more than 500 scientific papers and edited many books, including a series on nanoscience and technology.

Professor Stephen Liddle awarded RSC Corday Morgan Prize

Professor Liddle received this award for his outstanding contributions to actinide chemistry, including significant advances in our understanding of the bonding, reactivity and magnetism in uranium and thorium compounds in particular.

Athena SWAN Silver Award for the School of Chemistry

Professor John Helliwell, Dr Cinzia Casiraghi and Dr Anna Valota were presented with the Athena SWAN Silver Award from Dame Julia Higgins at the Athena SWAN Award Ceremony held at Imperial College London on the 12 November 2013. In 2016, the School was awarded an extension to the Silver Award which highlights the School's continued commitment to addressing gender inequalities and improving the career progression of female academics.



Professor Richard Winpenny elected as Fellow of the Learned Society of Wales

Head of School, Professor Richard Winpenny, has been elected as a Fellow of the Learned Society of Wales. Election to Fellowship is a public recognition of academic excellence, and LSW Fellowship is keenly competed. Fellows are elected following a rigorous examination of their achievements in their relevant fields. Fellows assist the Society in its work by serving on its various committees and working groups and by representing it nationally and internationally.



Research

Recent Grants

Prof Sabine Flitsch and **Prof Nick Turner** have been awarded a BBSRC IB Catalyst grant 'Glycoenzymes for Bioindustries' - £1.2M (September 2015)

Prof Jason Micklefield and **Prof Nick Turner** have been awarded a BBSRC IB Catalyst Grant 'A Synthetic Biology Approach for the Total Biosynthesis of Semi-Synthetic Antibiotics.' - £1.2M (April 2016)

Prof Steve Yeates and **Dr Cinzia Casiraghi** are co-investigators on **Prof Konstantin Novoselov's** (School of Physics and Astronomy) EPSRC Grant "Engineering van der Waals heterostructures: from atomic level layer-by-layer assembly to printable innovative devices" £3,502,777 (December 2015)

Prof Robert Dryfe is a co-investigator on **Prof Vladimir Falko's** (School of Physics and Astronomy) H2020 Graphene Flagship grant "Graphene-based disruptive technologies" £3,074,107 (November 2015.)



A photograph of two scientists in a laboratory. They are wearing white lab coats and safety goggles. The scientist in the foreground is wearing blue gloves and is carefully pouring a blue liquid from a pipette into a small flask. The background is a bright, modern laboratory with other people and equipment visible but out of focus.

“

The School of Chemistry has an international reputation in innovative, cutting-edge research in all areas of chemistry. There are more than 500 people engaged in research in our School.

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Find out more online

Accommodation

Discover your new home:

www.manchester.ac.uk/accommodation

Admissions and applications

Everything you need to apply:

www.manchester.ac.uk/ug/howtoapply

Alan Gilbert Learning Commons

Take a look around our 24/7,

independent learning space:

www.manchester.ac.uk/library/learningcommons

IT Services

Online learning, computer access, IT support and more:

www.manchester.ac.uk/itservices

Library

We have one of the UK's largest and best-resourced university libraries:

www.manchester.ac.uk/library

Maps

Find your way around our campus, city and accommodation:

www.manchester.ac.uk/aboutus/travel/maps

Prospectus

Download or order a copy of our prospectus:

www.manchester.ac.uk/study/undergraduate/prospectus

Childcare

Balancing your studies with your caring responsibilities:

www.manchester.ac.uk/childcare

Disability support

Talk to us about any support you need:

www.manchester.ac.uk/dso

Funding and finance

Get to grips with fees, loans, scholarships and more:

www.manchester.ac.uk/studentfinance

Careers

Take control of your career:

www.manchester.ac.uk/careers

International students

Let us help you prepare for your time here:

www.manchester.ac.uk/international

Sport

Get active with our clubs, leagues, classes and facilities:

www.manchester.ac.uk/sport



Support

Let us help with any academic, personal, financial and administrative issues:

my.manchester.ac.uk/guest

Students' Union

Immerse yourself in societies, events, campaigns and more:

manchesterstudentsunion.com

Videos

Learn more about us on our YouTube channel:

www.youtube.com/user/universitymanchester



Contact details

For further information about the courses, or about qualifications, please contact:

Undergraduate Admissions Office

School of Chemistry
The University of Manchester
Brunswick Street
Manchester
M13 9PL
United Kingdom

tel +44 (0)161 306 9271

email ug.chemistry@manchester.ac.uk

For the most up-to-date course information, please visit our website:

www.manchester.ac.uk/chemistry

Disclaimer

This brochure is prepared well in advance of the academic year to which it relates. Consequently, details of courses may vary with staff changes. The University therefore reserves the right to make such alterations to courses as are found to be necessary. If the University makes an offer of a place, it is essential that you are aware of the current terms on which the offer is based. If you are in any doubt, please feel free to ask for confirmation of the precise position for the year in question, before you accept the offer.



Charter for women in science
Recognising commitment to advancing
women's careers in STEM academia

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