UNIVERSITY OF LIVERPOOL

MChem

Medicinal Chemistry with Pharmacology with a Year Abroad

UCAS code F1B1

Entry requirements	Study mode	Duration
A level: ABB	Full-time	5 years

Apply by: **29 January 2025**
Starts on: **22 September 2025**

About this course

Chemistry graduates are at the heart of science, underpinning some of the world's most dynamic and exciting industries. Combining the study of chemistry with pharmacology, this MChem qualification makes an ideal foundation for a wide range of career pathways or to study for a PhD.

Introduction

This programme will give you a broad and detailed understanding of every aspect of advanced medicinal chemistry and pharmacology. On completion you will be ready to embark on a PhD in either chemistry or pharmacology or on a career in the pharmaceutical industry.

All our programmes have a common chemistry core which provides a good measure of flexibility and choice for you during the first two years. This programme shares this common chemistry core but you devote around 25% of your time to studying pharmacology and biomedical sciences.

The first two years of this programme are identical to the first year of the BSc Medicinal Chemistry (F1B2) programme. There are no optional modules, instead students take designated modules in biomedical and biological sciences and

medicinal chemistry. These first two years progress rapidly, with a mix of theory and practical modules to give you a solid grounding in the subject.

Since students enter the Department with a wide range of experience in mathematics (which is essential for studying chemistry to a high level) we provide a flexible tiered maths for chemistry course allowing you to develop your skills at your own pace.

During your year abroad, you will gain transferable skills that come with living and adapting to life in a different country; skills that will help with your employability and career prospects.

In year four, you continue with the Inorganic and Organic sections of the MChem Chemistry (F102) programme but instead of physical chemistry, you take designated pharmacology modules. You will start to apply your knowledge of chemistry and pharmacology to pharmaceutical problems, with particular reference to drug design and development.

Your final year brings you to the frontiers of chemistry and pharmacology and the basic concepts of both subjects are fully integrated. You will take core organic chemistry modules as well as core pharmacology modules such as drug metabolism and drug response, and cancer pharmacology.

Chemical research is particularly important in year four and involves you conducting a significant project with a strong medicinal chemistry theme as a member of one of the research groups in the department.

This degree programme has a year abroad option. The year abroad is an incredible new opportunity to spend one academic year at one of our partner universities expanding your academic and cultural horizons. You'll spend this time abroad in between your second and third years of study and your degree will extend by one year.

The Department of Chemistry is committed to continuous improvement of our curriculum. We are undergoing a curriculum review to further prepare our graduates for the next stage of their career by developing our degree programmes to incorporate knowledge and skills for the future workforce and ensure a positive learning experience for all students. Module and programme structures may change as we further develop an inclusive curriculum with enhanced sustainable, digital, and analytical chemistry elements. These aspects will sit alongside all the expected core chemistry components including organic, inorganic, and physical chemistry and professional skills.

What you'll learn

- Maths for Chemistry
- Drug design and development
- How drugs metabolise
- Cancer pharmacology
- Problem solving
- Computational modelling
- Molecular visualisation

Accreditation

This programme has master accreditation from the Royal Society of Chemistry (RSC).

Accreditation in detail

Royal Society of Chemistry

The Royal Society of Chemistry is a learned society for chemists in the United Kingdom.

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Course content

Discover what you'll learn, what you'll study, and how you'll be taught and assessed.

Year one

Modules

Compulsory modules	Credits
FOUNDATIONS OF MEDICINAL CHEMISTRY (CHEM141)	15
INTRODUCTION TO PHYSIOLOGY AND PHARMACOLOGY (LIFE106)	15
INTRODUCTORY INORGANIC CHEMISTRY (CHEM111)	15
INTRODUCTORY ORGANIC CHEMISTRY (CHEM130)	30
INTRODUCTORY PHYSICAL CHEMISTRY (CHEM152)	15
INTRODUCTORY SPECTROSCOPY (CHEM170)	15
KEY SKILLS FOR CHEMISTS 1 (CHEM180)	15

Programme details and modules listed are illustrative only and subject to change.

Year two

Modules

Compulsory modules	Credits
AN INTRODUCTION TO MEDICINAL CHEMISTRY (CHEM248)	7.5
COORDINATION AND ORGANOMETALLIC CHEMISTRY OF THE D-BLOCK METALS (CHEM214)	15
KEY SKILLS FOR CHEMISTS 2 (CHEM280)	15
MEASUREMENTS IN CHEMISTRY (CHEM246)	15
ORGANIC CHEMISTRY II (CHEM231)	15
PHYSICAL CHEMISTRY II (CHEM260)	15
PRACTICAL PHARMACOLOGY (LIFE234)	7.5
PREPARATIVE CHEMISTRY: SYNTHESIS AND CHARACTERISATION (CHEM245)	15
PRINCIPLES OF PHARMACOLOGY (LIFE207)	15

Programme details and modules listed are illustrative only and subject to change.

Year three

You are required to spend the year abroad on an approved placement at a European or overseas partner institution.

Programme details and modules listed are illustrative only and subject to change.

Year four

In year four, you further develop your skills in organic and inorganic chemistry as well as taking 30 credits of pharmacology modules.

Modules

Compulsory modules	Credits
ANTIMICROBIAL CHEMOTHERAPY FOR CHEMISTS (LIFE348)	15
DRUG ACTION (LIFE206)	15
FURTHER ORGANIC CHEMISTRY (CHEM333)	15
INORGANIC MATERIALS CHEMISTRY (CHEM313)	15
HETEROCYCLIC CHEMISTRY AND DRUG SYNTHESIS (CHEM338)	7.5
KEY SKILLS FOR CHEMISTS 3 (CHEM385)	7.5
MEDICINAL CHEMISTRY OF ANTI-INFECTIVES (CHEM335)	7.5
PRACTICAL CHEMISTRY YR3 FOR MCHEM STUDENTS - SHORTER VERSION (CHEM355)	15
PRACTICAL CHEMISTRY PROJECT YEAR 3 - AN INTRODUCTION TO RESEARCH METHODS (CHEM366)	15
PROTEIN STRUCTURE AND DYNAMICS (CHEM452)	7.5

Programme details and modules listed are illustrative only and subject to change.

Year five

Modules

Compulsory modules	Credits
ASYMMETRIC SYNTHESIS AND SYNTHETIC STRATEGY (CHEM433)	7.5

Compulsory modules	Credits
CANCER PHARMACOLOGY FOR MEDICINAL CHEMISTS (LIFE402)	7.5
CARDIOVASCULAR PHARMACOLOGY (LIFE401)	7.5
CHEM480 - CHEMICAL RESEARCH PROJECT (CHEM480)	60
DRUG METABOLISM AND RESPONSE (LIFE403)	7.5
MAIN GROUP ORGANIC CHEMISTRY (CHEM431)	7.5
NEUROPHARMACOLOGY (LIFE369)	7.5

Optional modules	Credits
APPLICATION OF ENZYMES IN ORGANIC SYNTHESIS - INDUSTRIAL BIOTECHNOLOGY (CHEM486)	7.5
ASYMMETRIC CATALYSIS FOR ORGANIC AND PHARMACEUTICAL CHEMISTRY (CHEM496)	7.5
INTRODUCTION TO NANOMEDICINE (CHEM426)	7.5
NANO ENERGY MATERIALS (CHEM482)	7.5
SOLAR ENERGY CONVERSION (CHEM464)	7.5
SOLID STATE CHEMISTRY AND ENERGY STORAGE MATERIALS (CHEM442)	7.5
SUPRAMOLECULAR CHEMISTRY (CHEM446)	7.5
APPLIED ORGANIC CHEMISTRY: BIOSYNTHESIS AND INDUSTRIAL SYNTHESIS OF NATURAL PRODUCTS (CHEM436)	7.5

Optional modules	Credits
PROTEIN STRUCTURE AND DYNAMICS (CHEM452)	7.5

Programme details and modules listed are illustrative only and subject to change.

Teaching and assessment

How you'll learn

Laboratory classes in years one and two prepare you for independent laboratory work in years three and four.

In year three you will carry out mini research projects, while in year four you will carry out research alongside PhD and postdoctoral researchers on cutting edge projects, often leading to a first scientific publication.

Computational modelling and molecular visualisation are introduced as interactive animated models from year one, reinforced as a key skill in later years and by year four you will be able to perform your own calculations to underpin final year research projects.

How you're assessed

You are assessed by examination at the end of each semester (January and May/June) and by continuous assessment of laboratory practicals, class tests, workshops, tutorials and assignments.

You have to pass each year of study before you are allowed to progress to the following year. Re-sit opportunities are available in September at the end of years one and two.

If you take an industrial placement, a minimum standard of academic performance is required before you are allowed to embark on your placements. All years of study (with the exception of year one) contribute to the final degree classification.

Liverpool Hallmarks

We have a distinctive approach to education, the Liverpool Curriculum Framework, which focuses on research-connected teaching, active learning, and authentic assessment to ensure our students graduate as digitally fluent and confident global citizens.

The Liverpool Curriculum framework sets out our distinctive approach to education. Our teaching staff support our students to develop academic knowledge, skills, and understanding alongside our **graduate attributes**:

- Digital fluency
- Confidence
- Global citizenship

Our curriculum is characterised by the three **Liverpool Hallmarks**:

- Research-connected teaching
- Active learning
- Authentic assessment

All this is underpinned by our core value of **inclusivity** and commitment to providing a curriculum that is accessible to all students.

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Careers and employability

Visits to the department by leading companies such as GlaxoSmithKline and Unilever ensure that you make contact with prospective employers at key stages in your final year. Graduates find employment in many areas, from the pharmaceutical industry to business management.

Typical careers of our graduates include:

- assistant analyst
- development chemist
- research assistant
- site chemist.

Recent employers of our graduates are:

- AstraZeneca
- GlaxoSmithKline
- IOTA Nansolutions Ltd
- Johnson Matthey
- Perstorp Caprolactones
- Shell
- Towers Watson
- Unilever
- United Utilities

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Fees and funding

Your tuition fees, funding your studies, and other costs to consider.

Tuition fees

UK fees (applies to Channel Islands, Isle of Man and Republic of Ireland)

Full-time place, per year - £9,535
Year abroad fee - £1,430 (applies to year in China)

International fees

Full-time place, per year - £29,100
Year abroad fee - £14,550 (applies to year in China)

The tuition fees shown are correct for 2025/26 entry. Please note that the year abroad fee also applies to the year in China.

Tuition fees cover the cost of your teaching and assessment, operating facilities such as libraries, IT equipment, and access to academic and personal support. Learn more about paying for your studies.

Additional costs

Your tuition fee covers almost everything but you may have additional study costs to consider, such as books.

Find out more about the additional study costs that may apply to this course.

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Entry requirements

The qualifications and exam results you'll need to apply for this course.

A levels

ABB including two science A levels, Chemistry and a second science. Acceptable second sciences are: Mathematics, Further Mathematics, Physics, Biology, Geography, Geology, Computing, Computer Science and Economics.

Applicants with the Extended Project Qualification (EPQ) are eligible for a reduction in grade requirements. For this course, the offer is **BBB** with **A** in the EPQ.

You may automatically qualify for reduced entry requirements through our contextual offers scheme. Based on your personal circumstances, you may automatically qualify for up to a two-grade reduction in the entry requirements needed for this course. When you apply, we consider a range of factors – such as where you live – to assess if you're eligible for a grade reduction. You don't have to make an application for a grade reduction – we'll do all the work.

Find out more about how we make reduced grade offers.

T levels

T levels considered in a relevant subject and specialism. Additional test required.

Applicants should contact us by completing the enquiry form on our website to discuss specific requirements in the core components and the occupational specialism.

GCSE

4/C in English and 4/C in Mathematics

Subject requirements

Where Chemistry is the only science A level offered, an offer may be made at AAB including an A in Chemistry.

For applicants studying A levels with English exam boards: Where a science has been taken at A level (Chemistry, Biology, Geology or Physics), a pass in the Science practical of each subject will be required.

BTEC Level 3 National Extended Diploma

D*DD in relevant diploma. Students will be invited to attend interview and take an assessment.

Applicants must be completing the BTEC National Extended Diploma in Applied Science and be studying the following optional modules:
• Applications of Inorganic Chemistry
• Applications of Organic Chemistry
• Practical Chemical Analysis.

For previous BTEC (QCF) qualification:

The Applied Science pathway is acceptable and the following optional modules must be studied:

• Chemical Periodicity and its Applications
• Industrial Applications of Organic Chemistry and/or Industrial Chemical Reactions
• Mathematical Calculations for Science and/or Using Statistics in Science
• Chemical Laboratory Techniques and/or Chemistry for Biology Technicians.

International Baccalaureate

33 points including 6 points from Chemistry at higher level and 5 points from one other science at higher level.

Irish Leaving Certificate

H1, H2, H2, H2, H3, H3 (including Chemistry and one other Science)

Scottish Higher/Advanced Higher

Not accepted without Advanced Highers.

Welsh Baccalaureate Advanced

Accepted at grade B, including 2 science A levels at grades AB including Chemistry.

Access

45 Level 3 credits in graded units in a relevant Diploma, including 30 at Distinction and a further 15 with at least Merit. 15 Distinctions are required in each of

Chemistry and a second science. Students will be invited to attend interview and take an assessment.

International qualifications

Select your country or region to view specific entry requirements.

If you hold a bachelor's degree or equivalent, but don't meet our entry requirements, you could be eligible for a Pre-Master's course. This is offered on campus at the University of Liverpool International College, in partnership with Kaplan International Pathways. It's a specialist preparation course for postgraduate study, and when you pass the Pre-Master's at the required level with good attendance, you're guaranteed entry to a University of Liverpool master's degree.

English language requirements

You'll need to demonstrate competence in the use of English language, unless you're from a majority English speaking country.

We accept a variety of international language tests and country-specific qualifications.

International applicants who do not meet the minimum required standard of English language can complete one of our Pre-Sessional English courses to achieve the required level.

IELTS

6.0 overall, with no component below 5.5

TOEFL iBT

78 overall, with minimum scores of listening 17, writing 17, reading 17 and speaking 19. TOEFL Home Edition not accepted.

TOEFL Paper

Grade 6 at Standard Level or grade 5 at Higher Level

Duolingo English Test

115 overall, with speaking, reading and writing not less than 105, and listening not below 100

Pearson PTE Academic

59 overall, with no component below 59

LanguageCert Academic

65 overall, with no skill below 60

Cambridge IGCSE First Language English 0500

Grade C overall, with a minimum of grade 2 in speaking and listening. Speaking and listening must be separately endorsed on the certificate.

Cambridge IGCSE First Language English 0990

Grade 4 overall, with Merit in speaking and listening

Cambridge IGCSE Second Language English 0510/0511

0510: Grade C overall, with a minimum of grade 2 in speaking. Speaking must be separately endorsed on the certificate. 0511: Grade C overall.

Cambridge IGCSE Second Language English 0993/0991

0993: Grade 5 overall, with a minimum of grade 2 in speaking. Speaking must be separately endorsed on the certificate. 0991: Grade 5 overall.

Cambridge ESOL Level 2/3 Advanced

169 overall, with no paper below 162

LanguageCert

Grade 4 at Standard Level or grade 4 at Higher Level

Pre-sessional English

Do you need to complete a Pre-sessional English course to meet the English language requirements for this course?

The length of Pre-sessional English course you'll need to take depends on your current level of English language ability.

Pre-sessional English in detail

If you don't meet our English language requirements, we can use your most recent IELTS score, or the equivalent score in selected other English language tests, to determine the length of Pre-sessional English course you require.

Use the table below to check the course length you're likely to require for your current English language ability and see whether the course is available on campus or online.

Your most recent IELTS score	Pre-sessional English course length	On campus or online
5.5 overall, with no component below 5.5	6 weeks	On campus
5.5 overall, with no component below 5.0	10 weeks	On campus and online options available
5.0 overall, with no component below 5.0	12 weeks	On campus and online options available
5.0 overall, with no component below 4.5	20 weeks	On campus
4.5 overall, with no component below 4.5	30 weeks	On campus
4.0 overall, with no	40 weeks	On campus

Your most recent IELTS score	Pre-sessional English course length	On campus or online
component below 4.0		

If you've completed an alternative English language test to IELTS, we may be able to use this to assess your English language ability and determine the Pre-sessional English course length you require.

Please see our guide to Pre-sessional English entry requirements for IELTS 6.0 overall, with no component below 5.5, for further details.

Alternative entry requirements

- If your qualification isn't listed here, or you're taking a combination of qualifications, contact us for advice
- Applications from mature students are welcome.

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