Medicinal Chemistry with Pharmacology with a Year Abroad MChem

COURSE DETAILS

- A level requirements: AAB
- UCAS code: F1B1
- Study mode: Full-time
- Length: 5 years

KEY DATES

- Apply by: 31 January 2024
- Starts: 23 September 2024

Course overview

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.

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).

Course content

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

YEAR ONE

COMPULSORY MODULES

FOUNDATIONS OF MEDICINAL CHEMISTRY (CHEM141)

Credits: 15 / Semester: semester 1

This module will introduce the area of medicinal chemistry and the underpinning cellular biology where it is applied. The course will delve into the chemical aspects of molecular and cellular biology and the processes that allow life to exist, and subsequently discuss the key cellular targets of interest to a medicinal chemist in the drug design process. This material will form the foundations needed to progress onto higher years of medicinal chemistry where modern case studies and the principles of pharmacology will be looked at in greater depth.

INTRODUCTION TO PHYSIOLOGY AND PHARMACOLOGY (LIFE106)

Credits: 15 / Semester: semester 2

This module introduces students to the fundamentals of human physiology and pharmacology and how they complement each other. The lectures will be supported with a range of learning support materials, for example multimedia and text based resources. Students will also be provided the opportunity to consolidate and extend their learning through a variety of assessments. The module will be assessed via two assessments; the first in week 6, which is a group poster worth 25% and an individual abstract for the poster worth 15%; the second at the end of the module, after week 12, which is a MCQ / MAQ assessment worth the remaining 60% for the module.

This module has a focus on the fundamental principles of physiology such has homeostasis and control of normal function, including examples such as the cardiovascular, respiratory, and nervous systems, plus others. In addition, the module introduces the underlying elements required to develop an understanding to study pharmacology in more detail. Its systems approach provides a solid foundation upon which a number of Biological and also Biomedical degrees can flourish.

INTRODUCTORY INORGANIC CHEMISTRY (CHEM111)

Credits: 15 / Semester: semester 1

This module gives an introduction to the chemistry of the main group elements, using the periodic table as the underpinning framework for understanding this chemistry, and develops students' analytical chemistry skills including volumetric and spectrophotometric techniques applied to materials that are familiar in everyday life.

INTRODUCTORY ORGANIC CHEMISTRY (CHEM130)

Credits: 30 / Semester: whole session

An Introduction to Organic Chemistry consisting of lectures, workshops and laboratory classes assessed continuously and by four class tests

INTRODUCTORY PHYSICAL CHEMISTRY (CHEM152)

Credits: 15 / Semester: semester 2

This module builds on the thermodynamics and kinetics that students have studied prior to University. Learning is supported by both problem-solving workshops and undertaking experiments in the laboratory

INTRODUCTORY SPECTROSCOPY (CHEM170)

Credits: 15 / Semester: whole session

This module will provide an introduction to a variety of spectroscopic techniques. Students will explore the theory underpinning various spectroscopic methods, how they are put into practice when acquiring spectra, and the interpretation of spectra to identify unknown substances.

KEY SKILLS FOR CHEMISTS 1 (CHEM180)

Credits: 15 / Semester: whole session

The aim of this module is: (i) to equip students with the basic quantitative transferable skills required for the first year of a Chemistry degree programme. (ii) to broaden a student's perspective of chemistry whilst developing their general transferable skills focusing on communication and employability. The overarching learning outcome is for students to have the key skills that will equip them to perform well in the rest of their chemistry degree programme.
Quantitative Key Skills will be taught using a lecture/workshop format involving problem solving classes, using computers where necessary. General Key Skills will involve a series of lecture-based presentations given by staff from the Department of Chemistry and the Careers Service together with a database workshop and small group tutorials. Extensive use of online platforms will be made.

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

YEAR TWO

COMPULSORY MODULES

AN INTRODUCTION TO MEDICINAL CHEMISTRY (CHEM248)

Credits: 7.5 / Semester: semester 2

This module introduces students to the fundamental principles that underpin modern medicinal chemistry.

COORDINATION AND ORGANOMETALLIC CHEMISTRY OF THE D-BLOCK METALS (CHEM214)

Credits: 15 / Semester: semester 2

The module introduces the descriptive coordination and organometallic chemistry and the concepts underpinning our understanding of this chemistry.

KEY SKILLS FOR CHEMISTS 2 (CHEM280)

Credits: 15 / Semester: whole session

This module aims to (i) further develop the quantitative skills of a student, (ii) introduce students to the Chemistry Key Skill of Molecular Modelling, and (iii) maintain student development of general transferable and employability skills. The overarching learning outcome is that students will gain the necessary key skills to perform well in their chemistry degree programmes. By the end of the module students will have improved their ability to perform and apply mathematical techniques to problems in kinetics, thermodynamics, quantum mechanics and molecular symmetry. They will have developed abilities to employ force-field and Quantum Chemistry techniques in Molecular Modelling using the Spartan package. They will also have further developed their range of transferable and employability skills, including written and oral communication and team working.

MEASUREMENTS IN CHEMISTRY (CHEM246)

Credits: 15 / Semester: semester 2

This is a practical module in which students learn the practice of taking physical measurements, the critical analysis and evaluation of experimental data, the application of measurements to the study of chemical phenomena and the dissemination of results.

ORGANIC CHEMISTRY II (CHEM231)

Credits: 15 / Semester: semester 1

This module is the core Organic Chemistry module for Year 2 Chemistry students. It introduces important carbon-carbon bond forming reactions within a mechanistic and synthetic framework, together with exposure to a selection of stereochemical issues.

PHYSICAL CHEMISTRY II (CHEM260)

Credits: 15 / Semester: whole session

This module expands on the fundamentals of Physical Chemistry that were introduced in Year 1. The principles and applications of thermodynamics, kinetics and spectroscopy are covered in detail with more emphasis on derivation of key results than in Year 1. Quantum mechanics is developed from the basic principles and mathematical description of quantum phenomena. It is applied to describe bonding in small molecules and in solids, and is linked to spectroscopy via detailed description of molecular energy levels and the possible transitions between these permitted by quantum mechanics.

PRACTICAL PHARMACOLOGY (LIFE234)

Credits: 7.5 / Semester: semester 2

This module aims to provide practical experience in many of the techniques specifically used in the study of Pharmacology. It will also provide you with the specialist skills and knowledge of techniques necessary to undertake practical work and project work in Year Three. Each practical will be introduced through a 15-20 minute presentation and will run for 3 hours. The module will be assessed through a report describing the experimental techniques and main findings of one of the key practicals, and through a final online assessment aimed at evaluating student understanding of the experimental approaches, underpinning pharmacological principles and data processing/interpretation.

PREPARATIVE CHEMISTRY: SYNTHESIS AND CHARACTERISATION (CHEM245)

Credits: 15 / Semester: semester 1

The module presents a unified approach to the synthesis and characterisation of organic and inorganic compounds, introducing a range of synthetic techniques, experiments and analytical methods.

PRINCIPLES OF PHARMACOLOGY (LIFE207)

Credits: 15 / Semester: semester 1

This module will provide an understanding of the quantitative aspects of drug action on cellular receptors and will address the relationship between drug efficacy and chemical structure.

The module will introduce the basic principles of pharmacokinetics, outline the relationship between drug concentration and response, and include an introduction to the principles of toxicity of drugs and their metabolites.

The module will provide knowledge of the molecular biology of receptors.

The lectures will be supplemented with online resources. Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module.

The module will be assessed by both an online test and a final examination.

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.

COMPULSORY MODULES

ANTIMICROBIAL CHEMOTHERAPY FOR CHEMISTS (LIFE348)

Credits: 15 / Semester: semester 2

This module is aimed specifically at F1B2 and F1BF students. The aim of this module is to reinforce the relevance and importance of the principles of chemotherapy learned in level 5 (antibacterial chemotherapy) and extend the application of these principles to diseases caused by viruses (e.g. HIV/AIDS) and parasites (e.g. malaria). The module will be assessed by coursework which will consist of TWO separate assessments.

Module material will be delivered primarily through a mixture of recorded and live online lectures as well as face-2-face on-campus sessions (subject to Covid-19 restrictions), supported by materials on Canvas and other web-based resources for students' independent learning. Students will be directed to key articles in the literature (textbooks, original papers and review articles) and be expected to use this material to inform their independent learning. A revision tutorial will prepare students for the second assessment (Week 13/14).

DRUG ACTION (LIFE206)

Credits: 15 / Semester: semester 2

This module aims to enable students to develop their understanding of the cardiovascular, endocrine and central nervous systems and the mechanisms by which drugs interact with physiological processes operating within each of these systems. They will also gain an appreciation of the drug development process, including clinical trials and drug regulation. The lectures will be supplemented with on-line resources. Students will be given guided reading, and regular formative assessment exercises in class will enable students to evaluate their understanding of the module. The module will be assessed by an online test and a final examination.

FURTHER ORGANIC CHEMISTRY (CHEM333)

Credits: 15 / Semester: semester 1

An extension of second year organic chemistry, covering pericyclic reactions, rearrangements and fragmentations, radical reactions, uses of phosphorous, sulphur and selenium in synthetic chemistry, as well as some core physical-organic concepts.

INORGANIC MATERIALS CHEMISTRY (CHEM313)

Credits: 15 / Semester: semester 1

This module builds on the fundamental inorganic chemistry that students have studied previously to give an appreciation of the science underpinning the development of modern materials. It will discuss the fundamentals of crystalline and disordered solids, and magnetism; methods for synthesising materials; characterisation techniques; applications of inorganic materials; and the link between the chemistry, structure and function of materials.

HETEROCYCLIC CHEMISTRY AND DRUG SYNTHESIS (CHEM338)

Credits: 7.5 / Semester: semester 2

The module presents the synthesis and reactivity of the most important classes of heterocyclic compounds and shows case studies drawn from major drug classes.

KEY SKILLS FOR CHEMISTS 3 (CHEM385)

Credits: 7.5 / Semester: semester 1

This module aims to help Chemistry students develop skills needed for further educational opportunities (i.e. MSc/PhD) or employment in a wide range of chemical and non-chemical based sectors. During the 'Employability skills' section, students will look at a variety of employability related skills, job application exercises, interview preparation techniques and presentation experience. This will be in the form of asynchronous lectures, online and in-person workshops and in-person tutorials and will require reflective thinking and group work – this will be facilitated by the module staff and other colleagues from the institution and wider industry. During the 'database' section, students will further their knowledge of the scientific literature developed during years 1/2 by engaging with more advanced aspects of various databases and writing a scientific electronic report of an experiment the students have completed in the laboratory.

MEDICINAL CHEMISTRY OF ANTI-INFECTIVES (CHEM335)

Credits: 7.5 / Semester: semester 1

This module will introduce students to the fundamental principles that underpin modern medicinal chemistry of anti-infective drugs, building on the principles taught in the introductory medicinal chemistry module CHEM248.

PRACTICAL CHEMISTRY YR3 FOR MCHEM STUDENTS - SHORTER VERSION (CHEM355)

Credits: 15 / Semester: semester 1

In this module, students will carry out a bespoke collection of advanced experiments in the areas of Organic Chemistry and either Inorganic or Physical Chemistry.

PRACTICAL CHEMISTRY PROJECT YEAR 3 - AN INTRODUCTION TO RESEARCH METHODS (CHEM366)

Credits: 15 / Semester: semester 2

This module is taken by year 3 MChem students in the 2nd semester. Students will be assigned mini research projects based on their project preference and potential projects offered by academic staff. Students carry out these projects in research labs for 9 weeks.

PROTEIN STRUCTURE AND DYNAMICS (CHEM452)

Credits: 7.5 / Semester: semester 2

This module discusses the application of basic physical chemistry concepts for describing protein structure and dynamics and shows how advanced physical chemistry methods are used for investigating these important aspects of proteins.

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

YEAR FIVE

COMPULSORY MODULES

ASYMMETRIC SYNTHESIS AND SYNTHETIC STRATEGY (CHEM433)

Credits: 7.5 / Semester: semester 1

This module will develop and extend the students' knowledge of modern organic chemistry, so that they will be able to enter directly into a PhD programme or embark on a career as a specialist chemist.

CANCER PHARMACOLOGY FOR MEDICINAL CHEMISTS (LIFE402)

Credits: 7.5 / Semester: semester 2

The aim of this module is to provide an understanding of cancer development and progression and how this is exploited in the rational design of drugs to target cancer. A further aim is to explain the molecular mechanism of anti-cancer drugs and the potential for side-effects, drug toxicity and drug resistance. The module will be assessed by a summative exercise and by a final examination.

CARDIOVASCULAR PHARMACOLOGY (LIFE401)

Credits: 7.5 / Semester: semester 1

The objective is to extend to Masters level the students' previous knowledge and understanding of cardiovascular pharmacology. The key topics covered in this module will include prevention and treatment of cardiovascular diseases including atherosclerosis, heart failure, hypertension, ischemic heart disease, arrhythmia, and drug-induced cardiovascular toxicity. Several classes of drugs currently used in cardiovascular medicine that were introduced in previous modules will be discussed in more detail, including lipid lowering therapy, anticoagulants, antiplatelet medications, antihypertensives, and anti arrhythmic drugs. Interindividual variability in response to cardiovascular medications will be covered as well as personalisation of drug therapy that has been established in the field of cardiovascular medicine. Several examples of how genetic makeup of an individual can affect response to medications will be discussed. A number of drugs from different clinical areas that have adverse effects on the heart and vascular system will be also covered. The module is taught through lectures. The assessment will take the form of a summative exercise covering aspects of the taught material.

CHEM480 - CHEMICAL RESEARCH PROJECT (CHEM480)

Credits: 60 / Semester: whole session

The aim of this module is to develop the skills necessary to undertake independent chemical research. Students carry out a research project of their choice in an area that is presently active in the department and that is aligned with our research clusters in Energy and Catalysis, Materials Chemistry, Medicinal and Bio-Nano Chemistry, Functional Interfaces, Theoretical and Computational Chemistry. This is delivered by becoming a member of a research group led by academic staff of the Department of Chemistry and by carrying out experimental or theoretical/computational work as a member of that research group. In addition, the student's skills in molecular modelling techniques in chemistry and chemical database skills are further developed and the student's employability awareness and skills will be enhanced.

DRUG METABOLISM AND RESPONSE (LIFE403)

Credits: 7.5 / Semester: semester 1

The aim of this module is to demonstrate the relevance and importance of the principles of drug metabolism and pharmacokinetics with a focus on medicinal chemistry. It will stress the importance of the relationship between drug disposition and drug response.

The module will be mainly taught through online lectures. Formative exercises will be submitted electronically, and feedback will be provided electronically. Online problem solving workshops will address the topics pharmacokinetics and physiologically-based pharmacokinetic modelling and will demonstrate the use of software.

The module will be assessed by two coursework assessments.

MAIN GROUP ORGANIC CHEMISTRY (CHEM431)

Credits: 7.5 / Semester: semester 1

The aim of this module is to broaden and extend the knowledge of modern Organic Chemistry, so that students will be able to enter directly into a PhD program or embark on a career as a specialist chemist. By the end of the module students will have achieved a solid foundation in Organic Chemistry.

NEUROPHARMACOLOGY (LIFE369)

Credits: 7.5 / Semester: semester 1

The aim of this module is to provide a review of drug treatment for common disorders of the brain, focusing on pathophysiology, receptors and ion channels as drug targets, and the mechanisms of action of key classes of neuropharmacological agents. The module will be assessed by both continuous assessment and by a final examination.

OPTIONAL MODULES

APPLICATION OF ENZYMES IN ORGANIC SYNTHESIS - INDUSTRIAL BIOTECHNOLOGY (CHEM486)

Credits: 7.5 / Semester: semester 2

The aim of this module is to provide students with a knowledge and understanding of the application of enzymes in organic synthesis with a focus on selectivity and sustainability. Selected industrial examples will illustrate where biocatalysis can replace or be combined with conventional chemical reactions in drug synthesis. The module will include an introduction to molecular biology, exciting new developments in the field such as directed evolution for the creation of designer enzymes, creation of artificial enzymes by combining chemo-and biocatalysis and development of synthetic pathways using enzymes. Industrial biotechnology is an important area for a sustainable future and this module will provide a solid foundation from a chemistry perspective.

ASYMMETRIC CATALYSIS FOR ORGANIC AND PHARMACEUTICAL CHEMISTRY (CHEM496)

Credits: 7.5 / Semester: semester 2

The aim of the module is to introduce students to the main aspects of asymmetric catalysis and its application in synthetic organic chemistry.

INTRODUCTION TO NANOMEDICINE (CHEM426)

Credits: 7.5 / Semester: semester 2

Nanomedicine is an increasingly important multidisciplinary, global science. This is an introductory module which aims to provide students with the essential knowledge required to understand the rapidly advancing field of Nanomedicine. Following some introductory lectures, students will undertake self-directed learning alongside
lectures to examine leading published research related to the design of advanced nanomedicines and clinical trials.
This module will be useful chemists who wish to develop a deeper understanding of colloid materials, gain a detailed insight into the advanced synthetic approaches used to produce nanomedicines and broaden their knowledge of pharmacology concepts.

NANO ENERGY MATERIALS (CHEM482)

Credits: 7.5 / Semester: semester 2

The module will deal with nanoscale energy materials focusing on the aspects relevant to catalysis, electrocatalysis, plasmonic heating, batteries and thermal energy storage. Particular emphasis will be placed on the reasons why nanomaterials are desirable for energy storage applications.
The goals of the module are (i) to introduce nanomaterials for energy storage; (ii) to introduce nanocarbons for thermal energy storage; (iii) to describe general methods for synthesis of nanomaterials.

SOLAR ENERGY CONVERSION (CHEM464)

Credits: 7.5 / Semester: semester 2

In part 1 the course covers the underpinning theory of electronic structure of solids relevant to solar energy conversion materials. In part 2 the course examines a range of established and developing solar energy conversion technologies using the concepts developed in part 1. The course revises and builds on the contents of core inorganic and physical chemistry modules from years 2 and 3.

SOLID STATE CHEMISTRY AND ENERGY STORAGE MATERIALS (CHEM442)

Credits: 7.5 / Semester: semester 2

The course will build upon foundations of descriptive aspects of solid state chemistry delivered in Year 1 (CHEM111) and more advanced topics delivered in Year 3 (CHEM313) to address a wide variety of research-led topics in the area of solid state chemistry synthesis and characterisation, with a focus on some of the relevant applications in energy materials. This will provide the student with a deep and high level understanding of the properties of solids, and currently active areas of research, to enable the student to pursue their interests to a deeper level independently (for example to PhD level).

SUPRAMOLECULAR CHEMISTRY (CHEM446)

Credits: 7.5 / Semester: semester 2

Supramolecular chemistry – or, "chemistry beyond the molecule" – covers a wide range of systems including host-guest systems, clathrates, cavitands, supramolecular polymers and gels, and makes use of non-covalent interactions. These weak and reversible forces—such as hydrogen bonds, hydrophobic forces, van der Waals forces, and metal–ligand coordination—are key to understanding biological processes and self-assembling systems, and to constructing complex materials and molecular machinery. This module is an introduction to this truly interdisciplinary and evolving field.
In this module, the students will be introduced to concepts such as molecular self-assembly, host-guest complexes and biological mimics. The course will also cover the latest developments in supramolecular chemistry, and highlight some of the key challenges in the field being addressed by researchers at Liverpool and beyond.

APPLIED ORGANIC CHEMISTRY: BIOSYNTHESIS AND INDUSTRIAL SYNTHESIS OF NATURAL PRODUCTS (CHEM436)

Credits: 7.5 / Semester: semester 2

This module focuses on the utility of organic chemistry for the industrial synthesis of a range of important natural products used in medicine, agriculture, food and perfume industry and domestic sector. It will help students to put a general knowledge of different classes of organic compounds and their reactivity into the context of real-world applications. The module will also highlight the history of discovery of some notable natural products and will demonstrate how rather obscure original findings were translated into successful industrial processes using recent developments in organic synthesis and catalysis.

PROTEIN STRUCTURE AND DYNAMICS (CHEM452)

Credits: 7.5 / Semester: semester 2

This module discusses the application of basic physical chemistry concepts for describing protein structure and dynamics and shows how advanced physical chemistry methods are used for investigating these important aspects of proteins.

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

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.

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

4 IN 5 **CHEMISTRY STUDENTS FIND THEIR MAIN ACTIVITY AFTER GRADUATION MEANINGFUL.**

Graduate Outcomes, 2018-19.

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	£9,250

International fees	
Full-time place, per year	£27,200

Fees are correct for the academic year 2024/25
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 tuition fees, funding and student finance.

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.

SCHOLARSHIPS AND BURSARIES

We offer a range of scholarships and bursaries to provide tuition fee discounts and help with living expenses while at university.

Check out our Undergraduate Global Advancement Scholarship. This offers a tuition fee discount of up to £5,000 for eligible students starting an undergraduate degree from September 2024. There's also the Liverpool Bursary which is worth £2,000 per year for eligible students.

Discover our full range of undergraduate scholarships and bursaries

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Entry requirements

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

Your qualification	**Requirements** About our typical entry requirements
A levels	AAB Applicants with the Extended Project Qualification (EPQ) are eligible for a reduction in grade requirements. For this course, the offer is **ABB** with **A** in the EPQ. You may automatically qualify for reduced entry requirements through our contextual offers scheme.
GCSE	4/C in English and 4/C in Mathematics
Subject requirements	For applicants from England: 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	Not accepted – applicants should apply for F1B2
International Baccalaureate	35 points including 6 points from Chemistry at higher level and 5 points from one other science at higher level
Irish Leaving Certificate	H1, H1, H2, H2, H2, H3 (including Chemistry and one other Science)
Scottish Higher/Advanced Higher	Not accepted without Advanced Highers

Your qualification	Requirements About our typical entry requirements
Welsh Baccalaureate Advanced	Accepted at gradeB, including 2 science A levels at grades AA including Chemistry
Access	Not accepted – applicants should apply for F1B2
International qualifications	Many countries have a different education system to that of the UK, meaning your qualifications may not meet our direct entry requirements. Although there is no direct Foundation Certificate route to this course, completing a Foundation Certificate, such as that offered by the University of Liverpool International College, can guarantee you a place on a number of similar courses which may interest you.

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.

THE ORIGINAL REDBRICK