

Pharmacology and Toxicology MSc

COURSE DETAILS

- Full-time: 12 months
- Part-time: 24 months

KEY DATES

- Apply by: [29 August 2025](#)
 - Starts: 22 September 2025
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Course overview

The Pharmacology and Toxicology MSc will provide you with an advanced understanding of the development of therapeutics, for applications in many communicable, and non-communicable diseases.

INTRODUCTION

The programme's mission is around making medicines better. Through optimisation of current treatments, understanding variability in patient responses from both an efficacy and safety perspective, and formulation of advanced therapeutics such as nanomedicines and cellular therapies, and making better medicines by developing the next generation of therapeutics. All of this is underpinned by a robust understanding of the processes that govern the biodistribution, pharmacokinetics, pharmacodynamics, and safety of these new, and improved, therapeutics.

The course is led by internationally recognised experts in the field of pharmacology, toxicology, and biocompatibility from both non-clinical and clinical departments. In practice, you will be provided with in-depth teaching on the processes underlying these areas, as well as the clinical and regulatory processes aligned to them. You will utilise real-world case studies of therapeutics under development by experts involved in these research areas prior to you joining one of these teams for the implementation of your final research project.

You will gain in-depth scientific knowledge and will receive training for research that can be applied to academic, commercial and healthcare settings. In addition, you will learn digital, programming and informatic skills that are of increasing importance for research and many employers.

WHO IS THIS COURSE FOR?

This master's is for graduates from a biomedical sciences background who want to pursue a career in pharmacology and toxicology.

WHAT YOU'LL LEARN

- Advanced research skills in pharmacology and toxicology, including digital fluency through informatics and programming skills
 - Experimental medicine and clinical pharmacology
 - Early phase clinical trial periods, encompassing phase I and II of the drug development pipeline
 - Core and novel aspects of toxicology in the context of the development of new medicines
 - Key advances in novel drug delivery systems
 - The emergence of advanced therapeutics, enabled by significant progress in biomedical science and technology.
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Course content

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

SEMESTER ONE

This course is still subject to approval, meaning course content may change.

Compulsory modules

Pharmaceutical Toxicology 2023–24: 15 Credits

This key module in the MSc Pharmacology and Toxicology programme brings together core and novel aspects of toxicology in the context of the development of new medicines. Topics include major organ toxicities, pharmacogenetics, development of in vitro test systems, nanotoxicology and computational/systems toxicology. This builds on local research strengths (e.g. Centre for Drug Safety Science) and strong links with the pharmaceutical industry and regulatory agencies. The module includes research connected lectures and seminars, from leading academic researchers based at the University of Liverpool, as well as external speakers. The two module assessments are aimed at writing reports on topics covered in the first and second half of the module, respectively.

COMPULSORY MODULES

INFORMATICS FOR LIFE SCIENCES (LIFE721)

Credits: 15 / Semester: semester 1

Bioinformatics is a key skill needed in many research settings. This module gives students a theoretical and technical grounding in a range of application areas including bioinformatics-related topics such as sequence analysis, phylogenetics, and the modelling of proteins, and others. While lectures are provided on core topics, there is a strong emphasis on practical exercises to demonstrate the application of common tools and data sources in these contexts. Teaching is delivered in the form of a weekly lecture and workshops. Students will be given guided reading and online activities to support their learning. The module will be assessed by two coursework assessments. The assessments will allow students to demonstrate their understanding of the tools used in workshops and interpretation of results.

BIOLOGICAL DATA SKILLS (LIFE707)

Credits: 15 / Semester: semester 1

Data skills are essential for a career in modern biology. Biological studies increasingly involve the generation of large or complex sets of data, and the ability to analyse data is a core component of a successful biologist's skill set. Digital fluency is also required more widely outside biological research and a grounding in data analysis is in demand by a broad range of employers. Here you will learn the ability to visualise data, critically test hypotheses, and to interpret and present results.

The learning and teaching materials are delivered as an online set of resources (available through Canvas) coupled with computer-based practical workshops. The module will also introduce students to the powerful open access statistical software package, R.

The module will be assessed by a written data analysis report and an open-book exam

For any students studying off-campus – due to a placement in industry or studying at an overseas University – on-line drop-in sessions will be provided instead of the practical workshops.

Any optional modules listed above are illustrative only and may vary from year to year. Modules may be subject to minimum student numbers being achieved and staff availability. This means that the availability of specific optional modules cannot be guaranteed.

SEMESTER TWO

Students will take 30 credits from the required modules.

Students will also select one 15 credit module from the optional modules.

Compulsory modules

Experimental Medicine and Clinical Pharmacology 2023–24: 15 Credits

The module will address the early phase clinical trial period, encompassing phase I and II of the drug development pipeline, which seeks to determine the safe dose of a novel treatment that has the most promise to be effective. The methodology is distinct from that of later phase effectiveness trials (phase III onwards).

The module includes research connected lectures, workshops and structured discussions on selected texts as student-led topics. The content will focus on methods for dose-finding and early efficacy studies. The module assessments are aimed at: 1) writing a report on a selected investigational product and the methods for dose finding 2) presentation of a key factor that contributes to the determination and management of risk. The factor focused on will be selected from workshops and student-led discussions. Students will acquire a good understanding of the theoretical underpinning early-phase dose-determining clinical trials. By the end of the module, students should have the knowledge and skills required to interpret pre-clinical data sufficient to plan, and manage, a phase I clinical trial

Frontiers in Drug Delivery and Advanced Therapeutics 2023–24: 15 Credits

Key advances in novel drug delivery systems and the emergence of advanced therapeutics enabled by significant progress in biomedical science and technology are not only transforming drug administration, but also changing our definition of 'drugs'. Organisations

are adapting very quickly to take advantage of the opportunities created by these advances to tackle some of the biggest health challenges. This key module in the MSc Pharmacology and Toxicology programme will equip students with competencies that will help them advance their career in these areas. The module includes research connected lectures, seminars and workshops on selected student-led topics. Assessment will be by a written report and a presentation.

OPTIONAL MODULES

COMPUTATIONAL BIOLOGY (LIFE752)

Credits: 15 / Semester: semester 2

With the advent of genomics and functional genomics, biology has become a quantitative data-rich discipline. This has created unprecedented opportunities in virtually every area of life sciences. With the right tools, it is now possible to address fundamentally important biological questions simply analysing already available datasets. This module is designed to prepare students for this very challenge. The module covers the most important aspects of computational biology. These range from the analysis of large datasets to infer biological mechanisms to the use of mathematical modelling to conceptualize and simulate complex biological phenomena. In addition to providing an intuitive overview of the basic theoretical principles, the module will focus on real life applications through multiple cases studies. Among these, students will learn how to identify drug targets and mechanisms of drug resistance and how to understand mathematical models of biological systems. They will then learn aspects of quantitative system pharmacology and physiologically based pharmacokinetic modelling pharmacokinetic/pharmacodynamic modelling.

The module will be taught through a combination of lectures, workshops and seminars. The module will be assessed via two written reports.

DIAGNOSTICS, THERAPEUTICS AND VACCINES (LIFE732)

Credits: 15 / Semester: semester 2

For students with interests in infection biology, the module will enhance skills and enable critically evaluation of key concepts, technologies and multifactorial considerations circumscribing diagnostics, therapeutics and vaccines. The module is topical in light of the current pandemic. The research-connected teaching will focus on prevention, limitation and treatment of infectious disease.

The module comprises lectures, workshops and seminars and uses active-learning delivery methods to ensure students can synthesise and evaluate relative merits, attributes, issues and applications of the topics. There are two coursework assessments in the module: 1) writing a report on a selected emerging pathogen that communicates the multifactorial considerations for researchers and society 2) presentation of a key factor that contributes to or affects disease emergence and the response by society or an agency. Materials will be included on the VLE to develop digital fluency and promote assimilation and appraisal of the module content.

PROTEOMICS METABOLOMICS AND DATA ANALYSIS (LIFE754)

Credits: 15 / Semester: semester 2

Proteomics and metabolomics represent powerful tools towards unbiased, quantitative and high-throughput analysis of biological systems. Rapid “omic” technological developments in the post-genomic era have provided insights into protein structures, biosynthesis and interactions, as well as the complex metabolic processes that are of significant importance in biological and medical research. The aims of this course are to provide a comprehensive understanding of proteomic and metabolomic techniques and related data analysis, and to illustrate how they can be applied in fundamental biological research and industrial applications. The module will be taught by lectures and workshops. The module will be assessed via two a scientific reports.

Any optional modules listed above are illustrative only and may vary from year to year. Modules may be subject to minimum student numbers being achieved and staff availability. This means that the availability of specific optional modules cannot be guaranteed.

FINAL PROJECT

COMPULSORY MODULES

MSC RESEARCH PROJECT (LIFE703)

Credits: 60 / Semester: summer

In this module students will work on a research project in their chosen area of study under the supervision of a project supervisor. Students are expected to work independently, with guidance provided by their supervisor. Students will create a plan of work at the start of the project, and will present their work orally, as well as write a final project report. Students will also be assessed on their approach and technique during the project. Students will defend their work in a viva at the end of the module. This module will give students experience in conducting their own independent research project, and the presentation of this work through oral and written formats.

Any optional modules listed above are illustrative only and may vary from year to year. Modules may be subject to minimum student numbers being achieved and staff availability. This means that the availability of specific optional modules cannot be guaranteed.

HOW YOU'LL LEARN

You will experience a range of teaching and learning methods, including lectures, seminars, workshops, data-handling and computation skills development and e-learning.

The taught components of the course are delivered by experts in their respective fields and are closely aligned to research within the Department of Pharmacology and Therapeutics, ensuring that all teaching is research-led.

Additionally, through the final research project, you will apply the knowledge and skills you have learned in the program by working within the laboratories of these research teams, at the cutting edge of R&D in Pharmacology. This is particularly suited for those wishing to go onto a research career, supported by PhD research.

HOW YOU'RE ASSESSED

Assessment of knowledge and understanding, practical skills and transferrable skills is through a blended mix of coursework that may include practical and project reports, essays, completion of workbooks, talks, data handling sessions and posters.

All modules will provide you with feedback on your learning progress and allow for adjustment of your learning. Electronic resources available on the University virtual learning environment support learning and teaching.

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

The Pharmacology and Toxicology MSc will provide you with the necessary knowledge and skills to become a professional scientist in the multidisciplinary areas of pharmacology and toxicology.

Commercial sectors such as the pharmaceutical, biotechnology and agriculture industries will be possible employers of graduates, especially with the anticipated increases in the development of new therapeutics, to meet emerging infectious diseases.

In the public sector, researchers are in demand in research institutes, government departments, the Health Service, forensic science and the Environment Agency.

For those committed to a career as a research scientist, this programme will qualify you to be able to take up PhD studies, research posts in academia or in industry or management posts in clinical trial units.

Career support from day one to graduation and beyond

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Career planning

[Our Careers Studio and career coaches can provide tailored support for your future plans.](#)

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From education to employment

Employability in your curriculum for a successful transition

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Networking events

[Make meaningful connections with like-minded professionals](#)

YOUR FUTURE

Commercial sectors such as the pharmaceutical, biotechnology and agriculture industries will be possible employers of graduates, especially with the anticipated increases in the development of new therapeutics to meet emerging infectious diseases.

In the public sector, researchers are in demand in:

- Research institutes
- Government departments
- The NHS
- Forensic science
- Environment Agency.

For those committed to a career as a research scientist, this programme will qualify you to be able to take up PhD studies, research posts in academia or in industry or management posts in clinical trial units.

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	£14,100
Part-time place, per year	£7,050

International fees	
Full-time place, per year	£29,100
Part-time place, per year	£14,550

Fees stated are for the 2025-26 academic year.

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

- You can [pay your tuition fees in instalments](#).
- All or part of your tuition fees can be [funded by external sponsorship](#).
- International applicants who accept an offer of a place will need to [pay a tuition fee deposit](#).

If you're a UK national, or have settled status in the UK, you may be eligible to apply for a Postgraduate Loan worth up to £12,167 to help with course fees and living costs. [Learn more about fees and funding](#).

ADDITIONAL COSTS

We understand that budgeting for your time at university is important, and we want to make sure you understand any course-related costs that are not covered by your tuition fee. This could include buying a laptop, books, or stationery.

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 that could help pay your tuition and living expenses.

We've set the country or region your qualifications are from as United Kingdom. [Change it here](#)

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POSTGRADUATE GLOBAL ADVANCEMENT SCHOLARSHIP – COURSE

◦ [International students](#)

[If you're an international student joining one of 30+ selected master's courses, you could be eligible to receive a discount worth £5,000 off your tuition fees, if you haven't studied with us before.](#)

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GRADUATE LOYALTY ADVANCEMENT SCHOLARSHIP

◦ [Home and international students](#)

[If you're a University of Liverpool graduate starting this master's degree with us, you could be eligible to receive a loyalty discount of up to £2,500 off your master's tuition fees.](#)

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CHILEAN NATIONAL AGENCY FOR RESEARCH AND DEVELOPMENT (ANID)

SCHOLARSHIP

◦ [International students](#)

◦ [Chile](#)

[If you're a Chilean student joining a master's degree, you could be eligible to apply for a 20% discount on your tuition fees with a Chilean National Agency for Research and Development \(ANID\) Scholarship. Scholarship.](#)

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CHEVENING SCHOLARSHIPS

◦ [International students](#)

◦ [Albania](#)

◦ [Algeria](#)

◦ [Anguilla](#)

◦ [Antigua and Barbuda](#)

◦ [Argentina](#)

◦ [Australia](#)

◦ [Azerbaijan](#)

◦ [Bangladesh](#)

◦ [Barbados](#)

◦ [Belize](#)

◦ [Bolivia](#)

- [Brazil](#)
- [British Virgin Islands](#)
- [Brunei](#)
- [Canada](#)
- [Cayman Islands](#)
- [Chile](#)
- [China](#)
- [Columbia](#)
- [Costa Rica](#)
- [Cuba](#)
- [Dominica](#)
- [Ecuador](#)
- [Egypt](#)
- [El Salvador](#)
- [Ghana](#)
- [Guatemala](#)
- [Guyana](#)
- [Honduras](#)
- [Hong Kong](#)
- [Iceland](#)
- [India](#)
- [Indonesia](#)
- [Iraq](#)
- [Jamaica](#)
- [Japan](#)
- [Jordan](#)
- [Kazakhstan](#)
- [Kenya](#)
- [Libya](#)
- [Malaysia](#)
- [Mauritius](#)
- [Mexico](#)
- [Moldova](#)
- [Mongolia](#)
- [Montserrat](#)
- [Morocco](#)
- [Nepal](#)
- [New Zealand](#)
- [Nicaragua](#)
- [Nigeria](#)
- [Pakistan](#)
- [Panama](#)
- [Paraguay](#)
- [Peru](#)
- [Philippines](#)
- [Russia](#)
- [Saint Kitts and Nevis](#)
- [Saint Lucia](#)

- [Saint Vincent and The Grenadines](#)
- [Serbia](#)
- [Singapore](#)
- [South Africa](#)
- [South Korea](#)
- [South Sudan](#)
- [Sri Lanka](#)
- [Sudan](#)
- [Taiwan](#)
- [Tanzania](#)
- [Thailand](#)
- [Trinidad and Tobago](#)
- [Turkey](#)
- [Turks and Caicos Islands](#)
- [Uganda](#)
- [Ukraine](#)
- [Uruguay](#)
- [Venezuela](#)
- [Vietnam](#)
- [Zimbabwe](#)

[If you're an international student from an eligible country, joining a one-year master's course, you could be eligible to apply for a Chevening Scholarship. If your application is successful, you could expect to have your master's fees paid, up to a maximum of £18,000, and receive additional help with living costs.](#)

CONSEJO NACIONAL DE CIENCIA Y TECNOLOGIA (CONACYT) AWARD

- [International students](#)
- [Mexico](#)

[If you're a Mexican student joining a master's degree, you could be eligible to apply for a 30% discount on your tuition fees with a CONACyT Award.](#)

FUND FOR THE DEVELOPMENT OF HUMAN RESOURCES (FIDERH) AWARD

- [International students](#)
- [Mexico](#)

[If you're a Mexican student joining a master's degree and you're in receipt of a FIDERH graduate loan, you could be eligible to benefit from a 20% discount on your tuition fees with a FIDERH Award.](#)

FUNED AWARD

- [International students](#)
- [Mexico](#)

[If you're a Mexican student joining a master's degree and you're in receipt of a FUNED loan, you can apply to be considered for a 20% tuition fee discount. A total of up to 50 awards will be available to master's and PhD students per academic year.](#)

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FUNED SCHOLARSHIP FOR WOMEN IN STEM SUBJECTS

- [International students](#)
- [Mexico](#)

[If you're a female Mexican student joining an eligible master's course in a science, technology, engineering or maths \(STEM\) subject and you're in receipt of a FUNED loan, you can apply to be considered for a 25% tuition fee discount. Up to five awards are available in each academic year.](#)

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HONG KONG GRADUATE ASSOCIATION & TUNG FOUNDATION POSTGRADUATE SCHOLARSHIPS

- [International students](#)
- [China](#)
- [Hong Kong](#)

[If you're a master's student from Hong Kong or the People's Republic of China who can demonstrate academic excellence, you may be eligible to apply for a scholarship worth up to £10,000 in partnership with the Tung Foundation.](#)

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HRH PRINCESS SIRINDHORN UNIVERSITY OF LIVERPOOL SCHOLARSHIP (THAILAND)

- [International students](#)
- [Thailand](#)

[If you're a student from Thailand joining a one-year master's degree, you might be eligible to apply to have your tuition fees paid in full and receive help with living costs. One award is available and only students who are new to the University will be considered.](#)

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HUMANITARIAN SCHOLARSHIPS FOR MASTER'S PROGRAMMES

- [International students](#)

[Do you have recognised status as a refugee or person with humanitarian protection outside the UK? Or are you a Ukrainian who's sought temporary protection in the EU? You could be eligible to apply for the full payment of your master's fees and additional financial support.](#)

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JOHN LENNON MEMORIAL SCHOLARSHIP

- [Home students](#)

[If you're a UK student, either born in or with strong family connections to Merseyside, you could be eligible to apply for a fee discount of up to £4,500. You'll need to demonstrate an active interest in global, community and environmental issues to be considered.](#)

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JUVENTUDES GTO SCHOLARSHIP

- [International students](#)
- [Mexico](#)

[If you're a resident of the state of Guanajuato in Mexico joining a master's degree, you could be eligible for a 10% discount on your tuition fees with a JuventudEsGto Scholarship.](#)

KAPLAN DIGITAL PATHWAYS EXCELLENCE SCHOLARSHIP

- [International students](#)

[Completed a Kaplan Digital Pathways Pre-Master's? We're offering a £5,000 fee discount off the first year of master's study for a maximum of two high achieving students joining one of our non-clinical master's courses from an online Kaplan Pre-Master's programme.](#)

MARSHALL SCHOLARSHIP

- [International students](#)
- [United States](#)

[If you're a USA student joining an eligible master's with us, you could be eligible to apply for a Marshall Scholarship. If your application is successful, your master's tuition fees will be paid in full. One Marshall Scholarship for master's study is available in each academic year.](#)

POSTGRADUATE OPPORTUNITY BURSARY

- [Home students](#)

[If you're a UK University of Liverpool graduate joining a master's degree with us, you could be eligible to receive £3,000 off your tuition fees. You must have graduated in the last two years and received a widening access scholarship during your undergraduate studies.](#)

SPORT LIVERPOOL PERFORMANCE PROGRAMME

- [Home and international students](#)

[Apply to receive tailored training support to enhance your sporting performance. Our athlete support package includes a range of benefits, from bespoke strength and conditioning training to physiotherapy sessions and one-to-one nutritional advice.](#)

TURKISH MINISTRY OF EDUCATION SCHOLARSHIP

- [International students](#)
- [Turkey](#)

[If you're a Turkish student joining a master's degree, you could be eligible to apply for a 20% discount on your tuition fees with a Turkish Ministry of Education Scholarship.](#)

UNIVERSITY OF LIVERPOOL INTERNATIONAL COLLEGE EXCELLENCE SCHOLARSHIP

- [International students](#)

[Completed a Pre-Master's at University of Liverpool International College \(UoLIC\)? We're offering a £5,000 fee discount off the first year of master's study to some of the highest achieving students joining one of our non-clinical master's courses from UoLIC.](#)

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UNIVERSITY OF LIVERPOOL INTERNATIONAL COLLEGE IMPACT PROGRESSION SCHOLARSHIPS

- [International students](#)

[If you're a University of Liverpool International College student awarded a Kaplan Impact Scholarship, we'll also consider you for an Impact Progression Scholarship. If selected, you'll receive a fee discount worth £3,000 off the first year of your master's course.](#)

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VICE-CHANCELLOR'S INTERNATIONAL ATTAINMENT SCHOLARSHIP FOR MAINLAND CHINA

- [International students](#)

- [China](#)

[Are you a high-achieving graduate from the People's Republic of China with a degree from a Chinese university? You could be eligible to apply for a £5,000 fee discount if you're joining an eligible master's course. Up to 15 eligible students will receive this scholarship.](#)

Entry requirements

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

Your qualification	Requirements About our typical entry requirements
GCSE	4/C in English and 4/C in Mathematics
Postgraduate entry requirements	We accept a 2:2 honours degree from a UK university, or an equivalent academic qualification from a similar non-UK institution. This degree should be in a Biological Sciences subject or equivalent. Candidates must have a scientific background acceptable to the Programme Director.
International qualifications	If you hold a bachelor's degree or equivalent, but don't meet our entry requirements, a Pre-Master's can help you gain a place. This specialist preparation course for postgraduate study is offered on campus at the University of Liverpool International College , in partnership with Kaplan International Pathways. Although there's no direct Pre-Master's route to this MSc, completing a Pre-Master's pathway can guarantee you a place on many other postgraduate courses at The University of Liverpool.

THE ORIGINAL

REDBRICK