

# Computer Science 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

If you didn't study computer science at degree level, this MSc combines a wide-ranging introduction to the analysis, design and implementation of computer systems, with a comprehensive understanding of cutting-edge research. You'll be immersed in software design, programming, datasets, information systems and web applications and develop all the skills needed to conduct independent research in computer science

## INTRODUCTION

This MSc provides a depth of knowledge in computer science, underpinned by a thorough understanding of key issues at the forefront of current research in this discipline.

You'll learn how to design and create software, gain experience of modern programming languages, and discover how databases are used in modern information systems, from supermarket checkouts to online banking.

We'll also equip you with a good understanding of the most significant technologies for developing web applications. These include HTML, Cascading Style Sheets, JavaScript, and PHP.

Further opportunities to specialise and enhance your knowledge are available through a range of optional modules. You could choose to focus on topics including artificial intelligence, biologically inspired optimisation, neural networks, data mining, machine learning, multi-agent systems, e-commerce, online map visualisations, or software safety and dependability.

You'll have the opportunity to work as part of a small group on a practical project to find a solution to a computer science problem. We'll also provide a thorough grounding in how to

plan and conduct research in preparation for your dissertation.

## **WHO IS THIS COURSE FOR?**

This MSc is suitable for graduates with a science or engineering background, such as a degree in mathematics or physical sciences, who wish to build upon the IT skills and knowledge gained during undergraduate study. The programme is not suitable for computer science graduates. If you already have a degree in computer science, you may be interested in [Advanced Computer Science MSc](#).

## **WHAT YOU'LL LEARN**

- Research skills in computer science
  - How to design and create software using a modern programming language
  - The role of structured query language, SQL, in information systems
  - Algorithmic techniques and data structures for large datasets
  - Key technologies for developing web applications
  - Data mining techniques and challenges using real-world datasets
  - Bio-inspired algorithms for optimisation and machine learning
  - Applications of multi-agent systems
  - Privacy, security, encryption and other technologies behind e-commerce
  - An understanding of all aspects of software safety and dependability
  - Neural networks for artificial intelligence
  - How maps can be visualised online
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## **ACCREDITATION**

The programme is accredited by BCS, The Chartered Institute for IT, the leading professional body for those working in IT. It is continually updated to reflect new technologies and trends.

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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

You'll study four compulsory modules in semester one.

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### COMPULSORY MODULES

#### RESEARCH METHODS IN COMPUTER SCIENCE (COMP516)

**Credits: 15 / Semester: semester 1**

In this module the students will learn and practise all the necessary skills needed to conduct independent research in computer science, including literature search, project management, presentation techniques, peer reviewing, writing skills and critical review of texts. They will also learn about the professional, legal, social and ethical framework of the IT industry. The module covers, e.g., planning and scheduling projects and drawing Gantt charts. Students shall also conduct a research project (including research, paper, literature review, or MSc project proposal, ...) and use tools like EndNote and Zotero bibliography manager within MS Word and Latex.

#### PROGRAMMING FUNDAMENTALS (COMP517)

**Credits: 15 / Semester: semester 1**

The aim of COMP517 is to help you to learn how to design and create software. Central to this will be an understanding of and practical experience with a modern programming language, but you will also be made aware of the importance of using sound software engineering techniques to develop high quality programs. As with many endeavours (swimming, chess-playing, story-writing) programming is a skill that must be learned and improved upon by constant practice. In this module, therefore, the emphasis will be on self-study. Although lectures will be used to introduce the various topics, you will be expected to spend the majority of your time attempting numerous exercises and completing the specified assignments.

## **DATABASE AND INFORMATION SYSTEMS (COMP518)**

**Credits: 15 / Semester: semester 1**

This module focuses on how databases are used in modern information systems. They are at the heart of almost all systems, such as supermarket checkouts, online banking, home rentals, and much more. One of the most successful data definition and manipulation languages is SQL, which will be covered in detail. The module will also introduce some of the fundamental concepts in computer science, as well as the mathematical underpinnings of relational databases and the techniques used to support concurrency and reliability in large information systems.

## **EFFICIENT ALGORITHMS (COMP526)**

**Credits: 15 / Semester: semester 1**

Masters module on practical algorithms and data structures for large datasets.

*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.*

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## **SEMESTER TWO**

You'll study one compulsory module and choose three optional modules in semester two.

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## **COMPULSORY MODULES**

### **WEB PROGRAMMING (COMP519)**

**Credits: 15 / Semester: semester 2**

Masters level introductory web programming module covering such topics as HTML, Cascading Style Sheets, CGI programming, and PHP/SQL programming.

## **OPTIONAL MODULES**

### **COMPUTATIONAL INTELLIGENCE (COMP575)**

**Credits: 15 / Semester: semester 2**

Biologically inspired optimisation and introduction to neural networks for artificial intelligence.

## **DATA MINING AND VISUALISATION (COMP527)**

**Credits: 15 / Semester: semester 2**

The module covers a range of topics and techniques for analyzing data. Students will learn about different types of data mining problems, including classification, clustering, association pattern mining, and social network analysis, as well as algorithms to solve them.

Students will program selected data mining algorithms from scratch using Python. This hands-on approach will allow them to gain a deeper understanding of how the algorithms work and how they can be applied to real-world datasets. They will experiment with different datasets to see how the algorithms perform and learn how to interpret the results.

## **MACHINE LEARNING AND BIOINSPIRED OPTIMISATION (COMP532)**

**Credits: 15 / Semester: semester 2**

This module teaches you about bio-inspired algorithms for optimisation and machine learning. The algorithms are based on reinforcement learning, DNA computing, brain or neural network models, immune systems, the evolutionary version of game theory, and social insect swarm behaviour such as ant colonies and bee colonies. These techniques are extremely useful for searching very large solution spaces (optimisation) and they can be used to design agents or robots that have to interact and operate in dynamic unknown environments (e.g. a Mars rover, a swarm of robots or network of satellites). The idea of learning optimal behaviour, rather than designing algorithms and controllers is especially appealing in AI.

## **SAFETY AND DEPENDABILITY (COMP524)**

**Credits: 15 / Semester: semester 2**

Safety and Dependability will cover techniques for the validation of systems against formal specifications. In a first part, safety specifications (something bad never happens) using the Hoare calculus and safe abstraction are covered. A second part refers to termination (something good eventually happens), exploiting well foundedness. In a third part, Markov chains and decision processes are studied, extending the qualitative safety and termination problems from the first part to qualitative/probabilistic properties, and extending them to a simple probabilistic specification language, PCTL. As part of the module, the ability of formulating (probabilistic) models as Markov chains and decision processes are taught, as well as the use of of-the-shelf tools like PRISM or IscasMC for their analysis.

## **REASONING ABOUT ACTION AND CHANGE (COMP525)**

**Credits: 15 / Semester: semester 2**

The module introduces the student to the use of logic as a tool for specifying the desired behavior of hardware, software and artificial intelligence systems, and for checking whether a given system does indeed behave as desired. The module enables the student to gain familiarity with a set of techniques which are critical in contemporary industrial applications and in academic research. It consists of 30 lectures and 10 practical sessions.

## **MULTI-AGENT SYSTEMS (COMP310)**

**Credits: 15 / Semester: semester 2**

Multi-agent systems have emerged as one of the most important areas of research and development in information technology in the 1990s. A multi-agent system is one composed of multiple interacting software components known as agents, which are typically capable of co-operating to solve problems that are beyond the abilities of any individual member. Multi-agent systems are important primarily because they have been found to have very wide applicability, in areas as diverse as industrial process control and electronic commerce. This module will begin by introducing the student to the notion of an agent, and will lead them to an understanding of what an agent is, how they can be constructed, and how agents can be made to co-operate effectively with one another to solve problems.

## **ONTOLOGIES AND SEMANTIC WEB (COMP318)**

**Credits: 15 / Semester: semester 2**

This module provides a basic introduction to the main principles behind representing and retrieving knowledge effectively on the Web. The module covers the evolution from the standard Web to the Semantic Web, and gives student the opportunity to gain an awareness of the main methods and techniques, including practical awareness, of the main issues arising in annotating web pages with semantic information, in interlinking pages with similar semantic content and in effectively querying these pages.

## **WEB MAPPING AND GEOVISUALISATION (ENVS456)**

**Credits: 15 / Semester: semester 2**

Through this module students will gain an understanding of how maps can be visualised online through a number of web platforms. Additionally, the internet will be presented both as a source of new data, and provide analytical functionality that can assist when solving geographic problems. Geographic data can be any dataset that can be visualised in a map. The module is taught through a mixture of lectures and practicals, and is assessed through two summative projects.

## **MSC GROUP PROJECT (COMP530)**

**Credits: 15 / Semester: semester 2**

This module is designed to allow students to consolidate work from the first semester by working as a programming team to realise a solution to a problem related to their programme of study.

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## **FINAL PROJECT**

## **COMPULSORY MODULES**

### **MSC PROJECT (COMP702)**

**Credits: 60 / Semester: summer**

Masters Level final project (individual project with dissertation)

*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.*

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## **HOW YOU'LL LEARN**

Teaching on this programme comprises formal lectures, small group tutorials and practical sessions in computer laboratories. You will also take part in one or more group projects. At the end of the year, you'll complete a major individual research project under expert supervision.

## **HOW YOU'RE ASSESSED**

Modules are assessed through a combination of examinations and coursework. The examinations take place at the end of each semester and typically take the form of an in-person written assignment, usually to be completed in a couple of hours. You'll be assigned coursework across the length of each semester. This typically takes the form of class tests, programming assignments or small projects.

Your dissertation is assessed through a combination of written reports and a presentation of your achievements.

## **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.

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# **Careers and employability**

The programme is accredited by BCS, The Chartered Institute for IT, for the purposes of partially meeting the academic requirement for registration as a Chartered IT Professional.

You'll graduate ready for a wide range of careers in the IT industry. You may wish to join the many students who seek employment at the interface of the IT domain and the subject matter of your first degree. The programme also provides a strong foundation for potential PhD research.

**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**

Previous graduates are working network systems and data communications analysis, computer software engineering, network and computer systems administration, and database administration.

Potential roles you would be well placed to secure on completion of this MSc include:

- Database administrator
- Information systems manager
- Applications developer
- IT consultant
- Network engineer

- Systems designer.

Many of our graduates also choose to continue their studies and embark on PhD research.

**87%** **OF COMPUTER SCIENCE STUDENTS FIND THEIR MAIN ACTIVITY AFTER GRADUATION MEANINGFUL.**

*Graduate Outcomes, 2018-19.*

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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	£13,300
Part-time place, per year	£6,650

International fees	
Full-time place, per year	£30,800
Part-time place, per year	£15,400

*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](#).

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## 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.

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## 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 – ACHIEVEMENT**

- [International students](#)

[If you're an international student joining a master's course with us, you could be eligible to receive a tuition fee discount of £2,500, based on your prior academic achievement, choice of course, and you not having studied with us before.](#)

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### **POSTGRADUATE GLOBAL ADVANCEMENT SCHOLARSHIP – COUNTRY**

- [International students](#)

- [Antigua and Barbuda](#)

- [Australia](#)

- [Bangladesh](#)

- [Barbados](#)

- [Belize](#)

- [Brunei](#)

- [Canada](#)

- [China](#)

- [Cyprus](#)

- [Dominica](#)

- [Egypt](#)

- [Ghana](#)

- [Grenada](#)

- [Guyana](#)

- [India](#)

- [Jamaica](#)

- [Japan](#)

- [Kenya](#)

- [Malaysia](#)

- [Mauritius](#)

- [Mexico](#)

- [New Zealand](#)

- [Nigeria](#)

- [Pakistan](#)

- [Saint Kitts and Nevis](#)

- [Saint Lucia](#)

- [Saint Vincent and The Grenadines](#)

- [Singapore](#)
- [South Africa](#)
- [South Korea](#)
- [Sri Lanka](#)
- [Tanzania](#)
- [Thailand](#)
- [Trinidad and Tobago](#)
- [Turkey](#)
- [Uganda](#)
- [Vietnam](#)

[If you're an international student joining a master's course with us, you could be eligible to receive a tuition fee discount of £2,500, based on your nationality, choice of course, and you not having 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.](#)

### **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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## **JUVENTUDESGTO 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.](#)

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## **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.](#)

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## **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.](#)

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## **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.](#)

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## **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.](#)

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## **THE AZIZ FOUNDATION SCHOLARSHIP**

- [Home students](#)

[If you're a British Muslim, active within a Muslim community and dedicated to bringing positive change to society, you could apply to potentially have the full cost of your master's tuition fees covered by an Aziz Foundation Scholarship.](#)

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## **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.](#)

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## **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.](#)

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# Entry requirements

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

Your qualification	Requirements <a href="#">About our typical entry requirements</a>
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 science or engineering related subject, such as Mathematics or Physical Sciences, but should not be in Computer Science.
International qualifications	Many countries have a different education system to that of the UK, meaning your qualifications may not meet our entry requirements. Completing your Foundation Certificate, such as that offered by the <a href="#">University of Liverpool International College</a> , means you're guaranteed a place on your chosen course.

