

# Cyber Security MSc

## COURSE DETAILS

- Full-time: 12 months

## KEY DATES

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

As our reliance on digital technologies grows, so does the need to defend them. With increasing cyber-attacks on critical infrastructures and personal information, the demand for cyber security has surged. This MSc aims to equip you with the knowledge and skills, including AI and machine learning techniques, to identify, mitigate, and prevent cyber threats and set you up for a thriving career in this rapidly evolving field.

## INTRODUCTION

Our Cyber Security MSc programme provides a solid foundation for you if you want to pursue a career or become a researcher within the field of cyber security.

The programme offers an exciting blend of learning experiences, delivered by world-leading experts and members of the University of Liverpool Cybersecurity Institute. We dive into the strategies, technologies, and methodologies used to protect digital systems from cyber threats, exploring critical issues and ethical considerations in the discipline.

You'll learn how to identify and respond to cyber-attacks and how to design, develop, and implement robust security systems. This includes studying essential areas like communication network security, cryptographic protocols, artificial intelligence, and digital forensics.

With training in machine and deep learning, intrusion detection, firewalls, and ethical hacking, you'll be prepared to detect and defend against evolving threats while understanding the legal and ethical dimensions of cyber security. You'll also gain insight into emerging fields such as quantum cryptography, Internet of Things (IoT) and nanotech security, equipping you to tackle future cyber challenges.

You will graduate with a wide range of career opportunities and will be equipped with the skills, knowledge and experience to make a real-world impact.

This is an exciting time to join this brand-new course. The University is recognised as an Academic Centre of Excellence in Cyber Security Research (ACE-CSR) by the National Cyber Security Centre (NCSC) and is committed to support and invest in the University's cybersecurity research capacity and capability.

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

This course is for you if you want to take the leap into cyber security. Our MSc is for graduates with a good first degree in a related subject including, but not limited to, computer science, IT, engineering, mathematics, physics, chemistry & medical sciences.

You do not require a programming background as there will be optional modules on programming.

## **WHAT YOU'LL LEARN**

- How to design, develop and implement secure systems using appropriate languages, algorithms and protocols
  - Critical assessment skills
  - To apply knowledge of legal, ethical and social implications of cyber security practices
  - How to effectively communicate cyber security concepts, research findings and project outcomes to both technical and non-technical audiences
  - The ability to evaluate and adapt to emerging technologies and challenges
  - Proficiency in forensic investigations, secure system design, and organisational security
  - How to plan, execute and critically evaluate a major cyber security related project
  - Practical and personal skills that are required to work as part of a team in today's IT industry
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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 three compulsory modules and one optional module in semester one. Based on prior knowledge and experience of programming, the optional module will either be Programming Fundamentals (COMP517) or one of either Quantum Computing (COMP345 – currently in development) and Knowledge Representation (COMP521). Prior programming knowledge will be assessed with an informal, ungraded programming task.

## 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.

### PRIVACY AND SECURITY (COMP522)

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

The module "Privacy and Security" covers topics such as: identification and authentication, monitoring protocols, attacks and defences, legal and ethical issues and future directions.

### COMMUNICATIONS NETWORKS (ELEC461)

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

This module introduces the principles of communications networks, their components and protocols.

Students are provided with basic concepts about network architectures, the reference models used to describe them, the major protocols used at each communications layer, and the tools to analyse the performance of link layer, median access control, Network and Transport layer protocols.

The main protocols for routing packets over the Internet are also introduced, along with an overview of the packet switching architectures used in the core of today's routers.

## **OPTIONAL MODULES**

### **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.

### **KNOWLEDGE REPRESENTATION (COMP521)**

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

The module introduces formalisms to reason about knowledge and information. One such formalism is epistemic logic, where one can explicitly represent of what an agent (robot, human, system) knows about the world or about others, as in "I have sent a message, how do I know that it has been received, and that the receiver knows I know this?"

*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 four compulsory modules in semester two. In addition to the three compulsory modules listed below, you'll also study Digital Forensics (COMP536). Students who have previously taken the module Computer Forensics (COMP343) on another course at the University of Liverpool will replace the module Digital Forensics (COMP536 – currently in development) with a suitable alternative. This will be agreed with the Director of Studies.

### **COMPULSORY MODULES**

#### **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.

## **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.

## **APPLIED ARTIFICIAL INTELLIGENCE (COMP534)**

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

This module gives an introduction to key areas of Artificial Intelligence (AI), including Machine Learning, Deep Learning, Natural Language Processing (NLP) and Computer Vision. It discusses fundamental problems in these areas and covers common methods to solve them.

Students will develop the practical skills necessary to build AI applications using data from different domains.

*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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## **FINAL PROJECT**

Your final project will give you the opportunity to work independently to explore a substantial problem in depth, making practical use of the principles, techniques, and methodologies you have acquired during the programme.

You will create a proposal, a presentation, and a final dissertation.

## **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 of 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 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

Cyber Security graduates have excellent employment prospects and the demand for qualified professionals is growing each year. With salaries across the sector rising, now is the perfect time to start your career.

## 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**

The University of Liverpool is one of the most targeted universities by top employers, according to [\*\*The Graduate Market 2024, High Fliers Research\*\*](#). This means our graduates are in demand for employment, and sought after by top employers worldwide.

Qualifying with a Cyber Security degree from Liverpool will equip you with the knowledge and confidence to explore opportunities in many sectors. The career opportunities in Cyber Security are vast. Graduates find work in roles such as:

- Cyber Security Analyst
- Security Architect
- Security Consultant

- Network Engineer
- Cyber Risk Management
- Cybersecurity engineer
- Information security engineer
- Information security analyst
- Cybersecurity officer
- IT Security specialist
- Cyber defence forensics analyst
- Digital forensics
- Vulnerability assessment analyst
- Cyber defence incident responder
- Security systems administrator
- Cryptography engineer
- Computer network defence analyst
- Cybersecurity incident handler
- & many more

In the UK, Salaries for cyber security analysts with one to three years' experience typically range from £37,500 to £52,500.

Experienced cyber security analysts with four to six years' experience can earn between £47,500 and £60,000, rising to between £65,000 and £80,000 for senior analysts with seven to nine years' experience.

In higher-level managerial or leadership roles, they may receive salaries ranging from around £72,500 to in excess of £100,000.

source: [Prospects](#), Sept 2024

Our graduates are also highly sought after in other industries for their analytical, communications, management, business and IT skills.

**£25,000–£37,000+ SALARY FOR ENTRY-LEVEL ROLES, WITH SALARIES RISING ACROSS THE SECTOR, AND HIGHER-LEVEL MANAGERIAL ROLES PAID IN EXCESS OF £100,000.**

*Prospects 2024*

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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

  

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

*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](#)

- **[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.](#)

- **[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.

## **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.

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

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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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## **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.

<b>Your qualification</b>	<b>Requirements</b> <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, Technology, Engineering, Mathematics, or Medical subject, including Computer Science. Previous experience with programming is not required.
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.

**THE ORIGINAL**

**REDBRICK**