

MASTER OF SCIENCE IN INFORMATION TECHNOLOGY



Master of Science in Information Technology Programme

The MSc is the ultimate qualification for the IT professional. Our programme enables you to accumulate new skills, deepen your understanding and advance your career. It aims to provide a stepping stone to managing a large IT department or becoming the technical driving force in a thriving new economy business.

Programme outline

Our MSc in IT programme will develop your theoretical knowledge of Computer Science and your problem-solving and analytical skills, while enabling you to achieve the ultimate qualification for the IT professional.

The programme structure is extremely flexible, enabling you to personalise your MSc through a wide range of electives, ranging from Programming the Internet to Computer Forensics, from Project Management to e-Commerce.

Programme structure

The programme begins with Computer Structures, which covers the foundations of computer science. Once this is completed, the student completes 3 more Core modules, and 4 electives enabling them to study as broadly or as specifically as they like, followed by a dissertation. Your first module will be 9 weeks in length where you begin with a week long brief introduction to the programme, the learning platform and then continue with the module content. Each following module is eight weeks in length. By taking one module at a time you can explore a specific subject in depth without distractions.

Personalised study

Students can customise their degree according to their individual requirements.

A Core modules

(these two modules are mandatory)

- Computer structures
- Professional issues in computing

(from this pair, choose one or both)

- Databases
- Computer Communication and Networks

(from this pair, choose one or both)

- Object Oriented Programming in Java
- Programming the Internet

B Elective modules

- Software Engineering
- Systems Analysis and Design Using an Object Oriented Approach
- Management of QA and Software Testing
- Security Engineering
- Computer Forensics
- Operating Systems Concepts
- Web XML Applications
- Internet and Multimedia Technology
- Human-Computer Interaction
- e-Commerce

C Dissertation

Students refine their dissertation topic in conjunction with their Personal Dissertation Advisor, an academic supervisor who will provide support throughout the study and writing process.



MSc Modules

Core modules:

Computer Structures

Aim: To provide a comprehensive overview of core software and hardware technologies.

This module covers everything from computer architecture to databases, algorithms, languages, operating systems, communications, computer networks, artificial intelligence and the theoretical foundations of computation. It will give you a sound theoretical and practical grounding on which to build your understanding of future technical developments.

Professional Issues in Computing

Aim: To provide a broad understanding of the social and legal context in which information technology operates.

This module examines the relationship between IT, society and the law. It helps develop an understanding of external matters affecting computer systems and organisations, provides an overview of professional and ethical issues and develops the skills required to manage systems in a way that is both effective and sensitive to their operating environment.

Databases

Aim: To equip you with a thorough understanding of the fundamental principles of database construction.

As already dominant database technology develops even further, you will analyse how data is stored, manipulated, queried (with an emphasis on relational databases) and backed up. You will also become acquainted with various paradigms and technologies (parallel as well as distributed) related to database design, implementation and maintenance.

Computer Communications and Networks

Aim: To familiarise you with the principles and techniques of computer networks.

As the development of computer communications accelerates with the exponential growth of the internet, this module examines a growing range of hardware technology protocols and network applications. You will learn the principles of communication networks and protocol architectures, assessing the suitability of different switching and multiplexing techniques for carrying a variety of distributed systems.

Object-oriented Programming in Java

Aim: To provide a theoretical and practical understanding of object-oriented programming and design using Java.

This module develops the essential problem-solving and programming skills you need to write well structured object-oriented programs in Java. On the way you will explore many other important techniques (such as modern distributed systems and component technology) based on the concepts that have made object-oriented programming today's predominant software development method.

Programming the Internet

Aim: To give you the theoretical and practical tools necessary for building advanced, content-rich internet sites.

This module covers markup languages and advanced technologies, including HTML, JavaScript, DHTML, CSS, XML and CGI. On completion, you will be able to design and create an advanced website and will be equipped to undertake complex internet projects.



Elective modules:

Software Engineering

Aim: To provide a firm theoretical foundation and practical skills in software engineering.

This module encompasses the theoretical foundation and practice of the three key phases of problem definition, software development and maintenance. It covers identification, definition, design, analysis, verification and management of basic requirements, coding, testing, evaluation and quality assurance. You will emerge equipped to lead a programming project and deliver products on time and within budget.

Systems Analysis and Design Using an Object-oriented Approach

Aim: To help you develop the critical skills to understand complex systems and problems and to create automated solutions.

This module takes a modern object-oriented approach to modelling systems and producing designs for software packages that can automate those systems. It will provide the skills you need to master this technique, as well as how to use the Unified Modelling Language (UML) to describe these models.

Management of QA and Software Testing

Aim: To provide an extensive understanding of how to guarantee software quality, including testing, maintenance and effective management.

This module provides the techniques you need to design and implement tests, conduct inspections and employ release and maintenance procedures. It also addresses key management aspects of the quality assurance process.

Security Engineering

Aim: To provide a grounding in the principles and practice of building secure distributed systems.

This module provides a foundation in the principles and practice of building secure distributed systems. You will discover how to protect systems against malicious attacks, using your understanding of technologies such as cryptology, software reliability, secure message transmission, tamper resistance, secure printing and auditing.

Computer Forensics

Aim: To provide an extensive range of forensic techniques to determine the root causes of breaches in computer security.

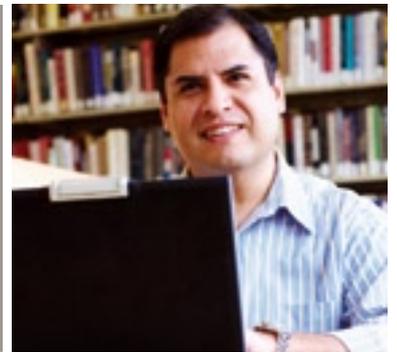
As concern grows over identity theft and information security, this module explains how to identify, extract, document, interpret and preserve computer media as digital evidence and how to analyse the root cause of security breaches. It will give you an understanding of electronic media, crypto-literacy, data hiding, hostile code, and Windows™ and/or UNIX system forensics in the digital environment.

Operating Systems Concepts

Aim: To cover the core concepts of modern operating systems, and provide an understanding of their application.

This module covers modern operating systems from the three key perspectives of design, functionality and applicability, giving you insight into the *what* and *why* of their structure. You will apply what you learn from simulations and projects in areas such as databases, networking and communications, programming languages and development, security, distributed systems, and internet-based development.





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NB You can only choose this elective module if you have not taken it as a required module.

Web XML Applications

Aim: To offer an overview of the uses of the XML language and its role in the next generation of e-business applications.

This module provides an understanding of core XML technologies, the standardised development environment they provide and their implications on future developments with internet applications. You will study XSL, databases and the information discovery and exchange standards, SOAP, WDSL, UDDI, and the use of XML for structuring data on the semantic web.

Internet and Multimedia Technology

Aim: To provide a theoretical and practical introduction to these specialist technologies.

Theoretical aspects encompass current developments in multimedia related to the internet, setting the scene for later in-depth investigations of a variety of scripting and enabling languages. You will develop your skills by applying theoretical and practical knowledge to a multimedia module for the internet.

Human-computer Interaction

Aim: To provide an understanding of the design, evaluation, and development of usable interactive application interfaces.

This module provides a thorough grounding in human-computer interaction, including user interface design principles, task analysis, interface design methods, auditory interfaces, haptics, user interface evaluation and usability testing. You will make extensive use of interface design tools to prototype user interfaces for traditional, web-based and mobile environments.

E-commerce

Aim: To provide an overview of key e-commerce issues.

An introduction to the fundamentals of e-commerce, from business models through technical infrastructure and implementation to social, legal and ethical considerations. You will act as a CIO/CEO working on an e-commerce business proposal, with evaluations from a peer review group. Learning to build an e-business holistically in a risk-free environment will help you become a more effective and successful manager.

Dissertation

Aim: To undertake a piece of original research to demonstrate your mastery and integration of knowledge you have acquired during the programme.

You choose your dissertation topic in conjunction with your personal dissertation advisor, an academic supervisor, who will provide support throughout the study and writing process. Your dissertation will apply your new knowledge and work experience and must have merit beyond the narrower scope of your particular need.

About the University of Liverpool

As a member of the Russell Group of leading research universities – the ‘Ivy League’ of UK higher education – the University of Liverpool is at the forefront of academic provision.

One of the first civic universities, Liverpool’s history dates back to 1881 and the establishment of University College Liverpool, which opened in 1882 with 45 students. Its iconic Victoria Building, which is still at the heart of the campus today, inspired the term ‘red brick university’. The college attracted the pioneers of the time, including Professor Oliver Lodge who made the world’s first public radio transmission in 1894 and demonstrated the first use of the X-ray for surgical purposes two years later.

The University of Liverpool received its Charter in 1903 and quickly established itself as a world-leader in research: over the next 100 years, eight Nobel Laureates would pass through its doors. Its global reputation for teaching and research has continued to the present day.

The *Financial Times* has ranked the University of Liverpool amongst the top 10 UK universities in terms of annual research income, and it is the 15th largest research university in the UK. The University is also placed in the top 25 universities in England according to the latest *Times Higher Education Supplement* World University Rankings. The University remains committed to the ‘advancement of learning and ennoblement of life’ which the people of Liverpool helped establish over a century ago. Its alumni include Dame Stella Rimington, former Director-General of MI5, architect Sir James Stirling and Tung Chee Hwa, former Chief Executive of Hong Kong.

The University has always encouraged innovation in learning and its pursuit of excellence has gained global recognition. At the same time, it has been a catalyst for pioneering educational programmes such as the partnership with Laureate that now delivers online Masters programmes to professionals all over the world.

For further information about the University of Liverpool please go to www.liv.ac.uk