# COMPUTER SCIENCE AND SOFTWARE ENGINEERING

The Computer Science and Software Engineering industries move fast and our MSc courses will help you stay at the cutting edge. Our students are well placed to both develop and exploit the emerging technologies that play a key role in defining the way society uses technology. Designers, programmers, systems analysts and project managers – our graduates are flourishing in the business, commercial and entrepreneurial sectors.

All of our Masters teaching is informed by links to industry and supported by up-to-the-minute research conducted by in-house research teams active in the areas like Data and Knowledge Management, Health and Social Care Modelling, Computational Intelligence, Parallel Computing, Distributed and Intelligent Systems, Semantic Computing, and Computer Vision and Imaging.

Our programmes are accredited* by BCS – The Chartered Institute for IT as meeting the requirements for Chartered IT Professional (CITP) Further Learning and partially meeting the requirements for Chartered Engineer (CEng). They also have Euro-Inf Master Quality Label accreditation* from the European Quality Assurance Network for Informatics Education (EQANIE).
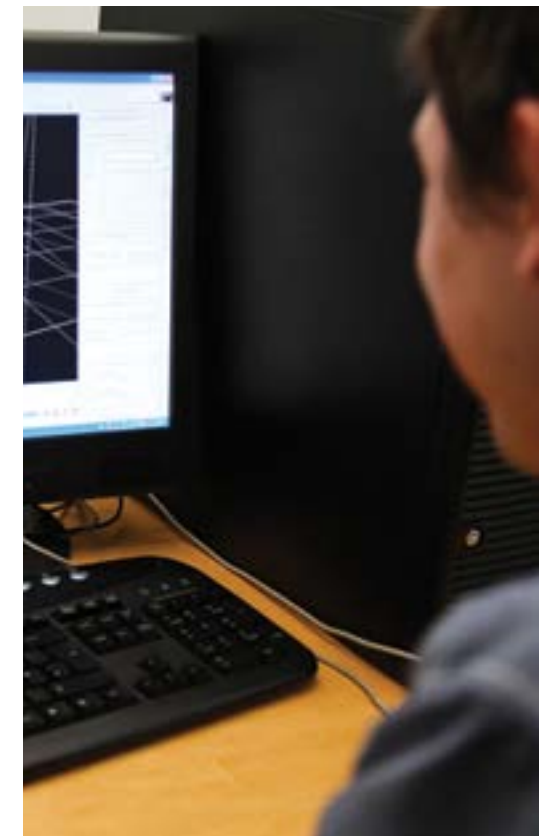
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*pending final confirmation following recent (re-)accreditation visit.

ADVANCED SOFTWARE ENGINEERING MSc

The Advanced Software Engineering MSc enable students to extend their knowledge of, and gain valuable experience in, software engineering as it applies to a number of new and important areas of IT and computing. You will be able to follow a flexible program of study designed to lead to, and enhance, a career in software engineering with a focus on new technologies and areas of application, such as cybersecurity, big data, or mobile application development.

The rapid pace of technical change in software development has been accompanied and compounded by an increase in the complexity of the systems that are developed. Recently this has been most noticeable in the increase in mobile computing and the use of sophisticated hardware that require developer knowledge of new paradigms.

Many applications that run on these systems whether mobile or stationary are distributed in nature and will consume web services provided by service-oriented architectures and cloud-based platforms. There has also been an increase in the use of virtualisation techniques for providing flexible and maintainable systems. Businesses are now regularly using virtualised systems and techniques to lower cost and complexity and increase availability in computing environments. The surge in cybersecurity issues and threats facing businesses and organisations that depend on IT systems has meant that software engineers need a thorough understanding of security when building and maintaining software applications and systems.

There is an acknowledged national shortage of IT and computing skills in the workforce. Most obviously, the rate of technological change means that an individual's specific knowledge frequently becomes out of date. Secondly, many significant technological developments originate in industry rather than academia, and are not yet firmly embedded in undergraduate curricula. Finally, many people enter the software industry without a specific educational background in computer science and acquire much vital knowledge in the workplace in relatively ad hoc ways.

Course content
The Advanced Software Engineering MSc takes into account the emerging needs of industry underpinned by theory and software engineering practices. As a consequence the modules emphasise both the critical conceptual underpinnings as well as the practical skills for each subject.

Length of course: one year full-time or two years part-time, starting in September

Location: Central London (Cavendish)

Faculty: Science and Technology

Course fees and funding: see course web page and westminster.ac.uk/fees

Entry requirements: see page 216

For full and most up-to-date information, see course web page: **westminster.ac.uk/advanced-software-engineering-msc**

Core modules
- Advanced Software Design
- Advanced Software Engineering Project
- Concurrency and Parallelism
- Enterprise Development
- Research Methods and Professional Practice

Option modules
- Advanced Big Data Analytics
- Big Data Theory and Practice
- Cloud Computing Applications
- Cybersecurity Threats and Countermeasures
- Data Mining & Machine Learning
- Data Visualisation and Dashboarding
- Free Choice Module
- Internet Security
- Mobile and Ubiquitous Computing
- Mobile Application Development
- Usability and User Experience Design

Professional recognition
This programme is accredited* by BCS – The Chartered Institute for IT as meeting the requirements for Chartered IT Professional (CITP) Further Learning and partially meeting the requirements for Chartered Engineer (CEng). It also has Euro-Inf Master Quality Label accreditation* from the European Quality Assurance Network for Informatics Education (EQANIE).

*pending final confirmation following recent (re-)accreditation visit.

Associated careers
Graduates will typically be part of a team working on sophisticated n-tier applications, as a designer, programmer, systems administrator or systems analyst (among others). Graduates will also find positions within new and established businesses that specialise in mobile applications. Other roles are possible in computer science research for either a commercial enterprise or academic institution. Further PhD study opportunities within the University of Westminster are also an option.

CYBER SECURITY AND FORENSICS MSc

Computers are central to all aspects of our daily lives; as industries ranging from communications to banking have come to rely on them, the need for improved computer security has never been greater.

This course focusses on two aspects of Cyber Security: analysis and assessment of risk plus how to minimise it, and, how to extract and use digital information from a wide range of systems and devices.

The course is structured so that all students cover the same introductory material, but then choose to specialise in either Cyber Security or Digital Forensics.

You will gain an understanding of the nature of the security threats that face computer systems and the type of information that is stored on digital devices (and how it can be extracted from them). You will benefit from a broad and varied array of state-of-the-art technologies, including:
- EnCase, FTK and open-source forensic tools, and a dedicated forensics computer laboratory
- Specialist input from guest lecturers
- Over 20 university computing laboratories providing access to Unix, Novell and NT servers, all supported by high-bandwidth networks
- Specialist technicians to ensure you can get the most out of these technologies.

Course content
All students take the core modules which are designed to give a comprehensive introduction to this specialist field. They will cover basic digital forensics and network security, and also cover computer system tools and the UNIX operating system. Dealing with digital evidence in a professional manner (that includes adhering to appropriate legal guidelines) is also covered. You will then follow either the Cyber Security or Digital Forensics pathway within the course (though each lead to the same named degree: the pathways are simply opportunities to specialise within the field). In addition, all students will take a Research Methods module and complete a project module.

The course offers the opportunity to examine a variety of tools available on the open market, and the use of forensic tools to retrieve data from electronic sources. It will also consider the analysis of professional and ethical issues relating to computer security and forensics, and the development of professional competencies, such as report writing and presenting evidence in court.

Length of course: one year full-time or two years part-time, starting in September

Location: Central London (Cavendish)

Faculty: Science and Technology

Course fees and funding: see course web page and westminster.ac.uk/fees

Entry requirements: see page 216

For full and most up-to-date information, see course web page: **westminster.ac.uk/cyber-security-and-forensics-msc**

Core modules
- Advanced Computer Forensics
- Computer System Tools
- Cyber Security and Forensics Project
- Cyber Security Applications
- Cyber Security Evidence and Procedure
- Cyber Security Pathway
- Cyber Security Threats and Countermeasures
- Data Recovery and Analysis
- Digital Forensics Pathway
- Fundamentals of Security Technology
- Internet Security
- Research Methods and Professional Practice
- Risk Management

Professional recognition
This programme is accredited* by BCS – The Chartered Institute for IT as meeting the requirements for Chartered IT Professional (CITP) Further Learning and partially meeting the requirements for Chartered Engineer (CEng). It also has Euro-Inf Master Quality Label accreditation* from the European Quality Assurance Network for Informatics Education (EQANIE).

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Associated careers
Depending on their chosen pathway graduates of the course are expected to find employment as information security/senior security officers and related cyber security roles or more technical roles investigating threats and safeguarding digital assets their life-cycle. Such roles will range from supporting industry, the public sector in general and the police and law enforcement agencies specifically, while some may focus more on researching new security threats and countermeasures.