

School of Electronic Engineering
and Computer Science
Undergraduate degrees
in Computer Science



Welcome to the world of Computer Science!

Career prospects

Computer science is changing our world and shaping its future. It plays a leading role in modern society, whether it is to help us in fighting crime, finding a cure for cancer, planning a mission to Mars, keeping in touch with our friends, listening to music on our MP3 players or enhancing our experiences at the movies. It is a fascinating and diverse field that brings together subjects like sociology, psychology, philosophy, biology, linguistics, logic and mathematics to drive scientific and technological progress forward.

Computer science is about problem solving. How can we build robots that can recognise human emotions; teach computers to spot suspicious behaviours in CCTV footage; help children to learn sign language using multimedia; predict football results or prices of shares; provide safe online shopping; help unlock the secrets of DNA; design good auditory-based user interfaces; write better code with fewer bugs; or automatically evolve intelligent games for mobiles? These are just some of the problems that our students have tackled as part of their final year projects.

Computer science is no more about computers than the music industry is about microphones.

A key skill in computer science is programming. Programming is incredibly creative and immediately applicable in the employment market. It relies on analytical thinking and logic to turn today's dreams into tomorrow's reality.

A degree in computer science gives you the opportunity to take an exciting and challenging adventure and will lead to a rewarding and interesting career.

See: www.dcs.qmul.ac.uk

According to government and industry predictions from around the world there are too few computer scientists to fill future job needs. This field is expected to grow much faster than other occupations as organisations continue to adopt and integrate increasingly sophisticated technologies. This boom is expected to create more than 200,000 new jobs from 2006-2012 in the UK alone.

Because computer science is everywhere, you can find your way into most careers. There is a great deal of versatility in careers available to computer science graduates – whether it is to do pure or applied computer science or even to branch out into different disciplines or vocations, such as bioscience, finance, medicine or journalism.

Our computer science graduates typically start out as trainee software engineers, business analysts, games programmers, multimedia specialists, web developers, database managers, systems administrators, e-commerce engineers, network engineers, systems analysts or testing engineers. From there, many organisations have clear routes into team leadership and more senior management or, if you prefer to remain technical, lucrative careers are available as software architects, specialist programmers and consultants. Other exciting possibilities constantly emerge as rapid changes in technology and software development lead to new roles. There is a buoyant employment market for good computer scientists. With the key skills of a computer scientist, you will be well placed to take advantage of these future possibilities.



Why study at Queen Mary?

We are well-known for our pioneering research and innovative research-led teaching. Some of our cutting edge research includes computer vision, music composition and artificial intelligence. Every member of our academic staff is an active researcher with an established national or international reputation. This not only gives the Department a real buzz and energy but also ensures that you can be confident of earning a world-class education.

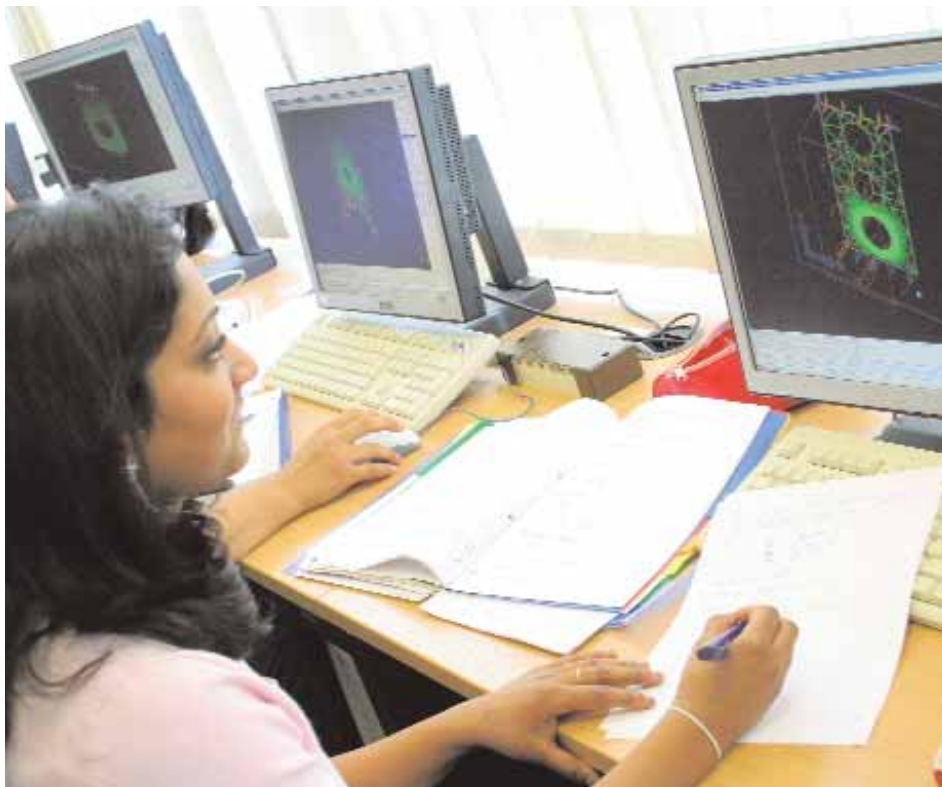
We have an outstanding reputation for teaching that stays up to date because of our enthusiasm and leading research. In a recent assessment of teaching quality by the UK government's quality assurance team, Queen Mary was awarded the highest possible rating. Our department was praised for good practice, student achievement and the quality of student learning opportunities.

Our award winning, state of the art Informatics Teaching Laboratory has more than 150 fully networked multimedia workstations for our students' use. Our Augmented Human Interaction Laboratory

combines advanced technologies including full body and multi-person motion capture (as used in films like The Matrix and Star Wars), virtual and augmented reality systems and advanced aural and visual display technologies. The Lab has attracted world-class sponsors such as Microsoft and video games manufacturer EA Games.

Highlights of our degree programmes include:

- a University of London degree that is recognised throughout the world,
- CEng accreditation from the British Computer Society,
- the option to take a one-year industrial placement as part of your degree,
- an innovative 'learn by doing' curriculum,
- specialist Computer Science degrees so that you can focus your programme on your interests, and
- a wide choice of three and four year undergraduate programmes.



Did you know?

- We are the only campus-based university in central London.
- We created cs4fn, the magazine and webzine on the fun side of computer science: www.cs4fn.org
- We helped set up the first internet node in the UK and were the first to provide the now popular Apple/Unix workstations for students.
- Our online Artificial Intelligence Project, Sodarace, www.sodarace.net, with BAFTA winners Soda Ltd., was selected for the prestigious Royal Society Summer Exhibition in 2005.
- We were the first College in the University of London to offer an undergraduate degree in Computer Science.
- We appointed one of the first women professors of Computer Science in the University of London.

Degree Programmes

Computer Science

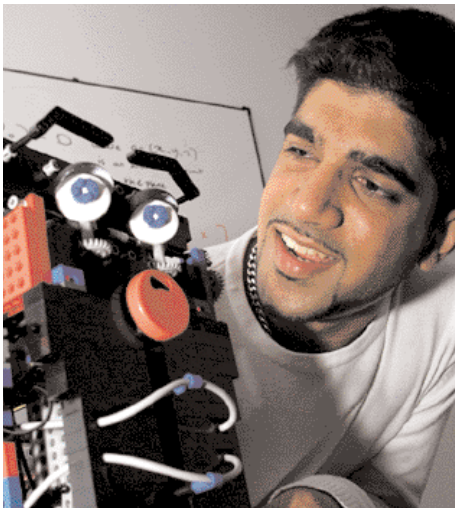
G400 BSc Computer Science (three years)

This popular degree programme offers you the widest range of study options and leads to a broad range of careers in computing.

The programme covers core topics in computer science with themes of software engineering, computer systems and applications. You will build a variety of computer systems in a range of progressively demanding situations. In the first year you will start to program using Java. In the second year the emphasis is on large-scale software engineering teamwork, covering design, systems analysis and team skills required by industry. In the final year you can specialise in topics that are of interest to you, including computer graphics, artificial intelligence, multimedia, software risk analysis and distributed systems. At the end of your final year you will submit an individual project undertaken with expert supervision.

G401 MSci Computer Science (four years)

This degree programme expands the G400 BSc Computer Science course with an extra year of study in advanced topics tied to the current research frontier in computer science. Material studied at the postgraduate level such as information, media and communication, computer vision, information retrieval, computer-mediated communication and interactive design is included.



Business options

G4N1 BSc Computer Science with Business Management (three years)

G4N2 BSc Computer Science with Business Management and Accounting (three years)

These degrees are for those whose main interest is in computer science but who want a fuller understanding of business management. They are of particular value to those seeking employment that combines the use of information technology with a deeper understanding of its business context in a managerial or marketing role.

The Computer Science with Business Management programme covers core computer science topics including programming together with management, marketing and economics for business. This programme's emphasis on computer science distinguishes it from the more application focused BSc Business Computing course. The Computer Science with Business Management and Accounting programme is similar while including core accounting modules.

G506 BSc Business Computing (three years)

In this programme you will develop an understanding of the factors influencing the development, deployment and use of information systems in a business context. You will learn how computer science techniques such as data mining and risk assessment can be used to support business processes.

G5N2 BSc Business Computing with Management (three years)

This degree is for those who want to understand how computer science techniques can be deployed to management in business computing. You will develop highly sought after practical skills in software engineering and programming to improve upon critical business systems. In addition to core computer science modules, you will study essential material in business management including the fundamentals of management, marketing and economics for business.



Multimedia and Web Technologies options

G450 BSc Computer Science and Multimedia (three years)

Multimedia, the use of graphics, animation, video and audio in a computer environment is a growing area in industry and this degree option aims to meet the increasing demand for multimedia specialists.

This course gives you a solid grounding in computer science with a specialised focus on multimedia in your final year. You will get a chance to explore such areas as the delivery of multimedia content over the internet, animation and compression techniques such as MP3 and 3D computer graphics. The programme also involves studying human factors in multimedia, designing graphical user interfaces and the study of interactive systems, focusing on understanding how culture and social activity can be supported by the latest technologies.



"The Computer Science Department is a great place to study. All the staff, from the people working at the reception and system services to lecturers and professors, are excellent at

their jobs and very helpful. My experiences with QM lecturers and professors have been positive throughout. I found my lecturers very engaged and enthusiastic about what they are doing. For me, the most important thing is to be surrounded and taught by people that can inspire you with their interest and knowledge of the subject."

Daniel Fiegenschuh,
BSc Computer Science
and Multimedia graduate

G452 BSc Multimedia Computing (three years)

This programme is aimed towards those who want an integrated multimedia computing degree that focuses specifically on the practical techniques and technologies of computer programming for multimedia applications. You will develop a range of skills in programming and software engineering. Its focus is on practical engineering applications such as digital broadcasting, web technologies, interaction design and multimedia systems. It will appeal to those who already know that multimedia is their area of interest and wish to be more selective in their study of computer science.

G451 Computer Science and Web Technologies (three years)

This programme is designed to meet the shortage of skilled professionals in the fast growing field of web technologies. You will gain a solid grounding in computer science because the first two years of this programme follows the core computer science degree. In the final years you will get an in-depth knowledge of web technologies, including XML, web technologies for mobile devices and designing graphical user interfaces.

Queen Mary is one of the best universities to attend for both high starting salaries and employability. The College was fifth place in the UK for starting salaries (*The Sunday Times' University Guide, 2007*) and *The Guardian* (2007) stated, "it's one of the best universities for student employability - and graduate starting salaries."



Degrees with Industrial Experience



G402 BSc Computer Science with Industrial Experience (four years)

G505 BSc Business Computing with Industrial Experience (four years)

G453 BSc Multimedia Computing with Industrial Experience (four years)

We offer several of our BSc programmes with an Industrial Experience option. These sandwich degrees combine academic study with a one-year industrial placement between your second and third years of study. Taking the Industrial Experience option as part of your degree gives you a route to develop real-world, practical problem solving skills in a professional context. This can give you an importance edge in the graduate job market.

As a leading research department, we have excellent links with industry, both within the UK and internationally. We also employ dedicated staff to help you arrange your year in industry at either one of our partner companies or at a company of your choice. We will also provide you with additional training and support in developing professional skills such as interview techniques and CV writing to help you secure a good position.

Degree Programmes (cont)

GG41 BSc Computer Science and Mathematics (three years)

This dual programme allows you to choose from a wide range of options from the computer and mathematical sciences. You will develop skills in mathematical modelling that are important in diverse industries from financial services to telecommunications.

Study options offered include pure computer science, such as programming and software engineering, and pure mathematics modules, such as calculus and geometry. You can also choose modules that overlap the two subjects, such as algorithms, graph theory, computability and combinatorics.



GR41 BA French, Linguistics and Computer Science (four years)

GR42 BA German, Linguistics and Computer Science (four years)

GR44 BA Hispanic Studies, Linguistics and Computer Science (four years)

GR47 Russian, Linguistics and Computer Science (four years)

These are specialist degree courses that combine the formal study of languages and linguistics with computer science. These degrees can lead to an international management career or give you unique skills for working on the next generation of linguistically enabled computers.

You will study all of the major areas of linguistics, learning about the rules that govern languages as well as their meaning, while acquiring a solid grounding in computer science. You will also study a language and will normally spend the year between your second and third years of study abroad. You will learn how to use your computer expertise to design and build computer applications for handling language.

Award winning teaching: Paul Curzon won the QMUL Drapers' Prize for Excellence in Teaching and Professor Peter McOwan was awarded a National Teaching Fellowship by the Higher Education Academy.



"I decided to study at Queen Mary for several reasons. I was offered the course I wanted, the Department has all of the facilities to support it and, best of all, everything I need is located at one campus. The Students' Union, the departments I am involved with, all my lectures and the various help and support services are in one place. Queen Mary's central location and excellent reputation were also strong reasons behind my choice to study here."

Samia Faruq, BSc Computer Science with Multimedia graduate, current PhD student

Entry requirements

Our BSc entrance requirements are given below. Our MSci Computer Science programme requires higher grades and a minimum of 300 tariff points because of its advanced nature. Previous programming experience is useful but not required.

A-levels

We require a minimum of 260-300 points and a minimum of GCSE mathematics at level C. Although neither A-level computing nor A-level ICT are essential requirements, A-level computing can be helpful. We look favourably upon applicants who combine A-levels in a science subject such as mathematics or physics with a contrasting subject such as English or arts. We include in the tariff points subjects only taken to AS-level but we do not include key skills.

AVCE

We require an A or B in a single unit AVCE ICT or A/B in AVCEDA ICT as well as a pass in at least one other A-level or two AS-levels. We would normally interview you.

BTEC

Your BTEC must be in computing or a related subject. We require an overall DDD. All programming modules should be passed at Distinction level. A minimum GCSE Maths grade C is required. We would normally interview you.

Access

We will consider applicants with Access qualifications if they have one of the following additional criteria: past employment in computer programming, previous qualifications in mathematics equivalent to UK AS-level or a reference from a tutor suggesting exceptional aptitude beyond the normal requirements for an Access pass. We would normally interview you.

International Baccalaureate

We welcome students with IB qualifications. We require a minimum of 32 points overall including at least six points in mathematics and six points in English.

For current and more detailed information, please see www.dcs.qmul.ac.uk/undergraduate/entry/

Queen Mary, University of London

Queen Mary is the fourth largest college of the University of London and teaches a full range of subjects across science, engineering, medicine, social science and humanities. The College's strong reputation for teaching and research has led to increases in the number of applications in recent years.

In 1989 Queen Mary was formed from the merger of Queen Mary College and Westfield College. The campus is located on the historic home of Queen Mary College which began life in the nineteenth century as the People's Palace, a philanthropic centre for the intellectual and cultural improvement of east Londoners. Westfield College was founded in 1882 in Hampstead as a pioneering college for the higher education of women.

In 1995 the College merged again, this time with two leading medical colleges, to create Barts and the London School of Medicine and Dentistry within Queen Mary. The London Hospital Medicine College, England's first medical school, was established in 1785 and St Bartholomew's Hospital Medical College was founded in 1843.

We are unique in being a compact campus university in the centre of the capital and one of the very few city-based campus universities in the UK. Our students have the best of both worlds. On the one hand, you experience life in one of the great global cities and, on the other, benefit from the convenience of living on-campus. Our Student Village adds an additional thousand study bedrooms to the existing halls of residence at our Mile End campus. Students living on-campus are only five minutes from their beds to their lectures.

Living on campus is incredibly convenient: everything is nearby. Between cafés and bars, library and computer suites, lecture theatres and classrooms, gym and squash courts, you'll find that all of the facilities that you needs are located within a short walk. The Student Village has a laundrette, shop, café, common room and 24 hour security, making it feel like a real community and a place where you'll feel at home right from the start of your time at the College.

The large number of students on campus means that there are many opportunities to interact and be part of clubs and societies, student volunteering and other programmes run by the Students' Union.



For further information, please see our website: www.dcs.qmul.ac.uk or contact us at:

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The information given in this brochure is correct at the time of going to press. The College reserves the right to modify or cancel any statement in it and accepts no responsibility for the consequences of any such changes.

Will I be any good at Computer Science?

Computer scientists need to be good all-rounders... they need to be logical, creative thinkers whilst also being good problem-solvers. Here are some problems – see how you do!

Su Doku

Su Doku is a popular puzzle, perfect for passing time while travelling, for example. Your challenge is to complete the grid in such a way that each of the nine rows and columns, and each of the nine 3x3 squares contain all the numbers between 1 and 9 exactly once.

For the answer see: www.cs4fn.org

Magic?

Imagine you have a handful of 1p coins and 10p coins. Now, total the value of the imaginary coins in your hand. Let's now focus down to a single digit for you to concentrate on. From the total value subtract, lets say, the number of coins in your imaginary handful of change. If this value is a two or three digit number, then add the digits together so that you end up with a single digit.

Concentrate on this final digit and take a look at our prediction below.

Build a future human

Using the Internet as a research tool and your imagination you should attempt to predict how the human of 50 years from now will look, communicate, work, play and live. As new technologies are developed, computer science changes the way we live our lives; imagine if you didn't have your mobile phone or the Internet? There are research projects going on throughout the world today looking at how to build computers into our clothes and furniture, even into trashcans. There is also work on connecting computer systems directly to our brains and bodies, to help restore sight to the blind, hearing to the deaf and even some attempts to give humans extra senses such as ultrasonics.

Base your predictions on actual computer science projects currently underway. Enter our future human competition at www.cs4fn.org

What does all this have to do with computer science?

Su Doku: Just like computer science, Su Doku builds on logic: you use rules to deduce the solution to the puzzle. As a programmer you need to be able to think clearly and methodically to work through a problem.

Magic: Curious to know how the mathematic works – see www.cs4fn.org/mathmagic/

To design computer systems that are usable, you need to understand people too. For example, your MP3 player is playing tricks on you to ensure that the music you hear sounds high quality but takes up as little storage as possible.

Future human: To build successful systems that are used you need to understand how they might affect society too.

For more of the fun side of computer science, see www.cs4fn.org

Feel free to photocopy for class use.

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Magi? You were concentrating on 9