

Newcastle University

Undergraduate Study

Computing Science

Why study computing science?



Computers play a vital role in our everyday lives and computer scientists deal with all aspects of working with computers, including programming, e-commerce, databases and human–computer interaction. It is thanks to computer scientists that we can surf the Internet, play computer games, send e-mails, and keep in touch with our friends using social networking software.

Newcastle University is one of the UK's leading centres for computing science and you will be taught by educators and researchers of international standing. The degrees on offer provide an excellent grounding in the basic principles of the subject as well as the opportunity to appreciate and experience the most recent advances in computing science.

> "I have really enjoyed my course. It is so friendly here and all the staff are easy to get on with."
>
> **Melissa**, Computing Science BSc Honours

We offer a number of BSc Single Honours degrees related to computing science:

- Computing Science
- Computing Science (Networked Systems and Internet Technologies)
- Computing Science (Games and Virtual Environments)
- Computing Science (Software Engineering)

Each of these degrees is also offered with an additional year in industry. The degrees in computing science emphasise the techniques required to develop systems and applications software, and provide an understanding of the architectures on which the software runs. In your final year you develop your particular interests through a range of specialist topics and your degree title will depend on this choice.

There are also three BSc Single Honours degrees related to information systems:

- Information Systems
- Information Systems with Business Studies
- Information Systems with Management

Each of these degrees is also offered with an additional year out in industry. The degrees in information systems are more applications-oriented. Whilst they cover some of the material of the computing science degrees, they also allow you to combine your computing studies with other subjects, such as business, economics, law, management or a modern foreign language, in each year of study. Again, these choices will determine your final degree title.

Computing Science at Newcastle

Excellent teaching and research

Computing Science at Newcastle has an international reputation for excellence in both teaching and research. The Research Assessment Exercise (RAE) is the UK's official survey of research quality in universities and higher education colleges. In the 2008 RAE, 70 per cent of our research was classed as world leading or internationally excellent, with research strengths in a number of fields. These include eScience, distributed systems, bioinformatics, security, human–computer interaction (including computer graphics), and theoretical computing science. This feeds into our undergraduate teaching and ensures that our degree programmes incorporate the very latest developments in computing.

During your time at Newcastle a member of academic staff will act as your personal adviser and assist you with your choice of modules, as well as help you deal with any problems you may encounter. We are very proud of the friendly and informal relations between staff and students – our academics have an open-door policy for their tutees.

First-class facilities

Naturally, you will have access to the very latest computing facilities, including our modern dedicated teaching labs. Our students also benefit from a large number of networked computer systems and specialist pieces of research equipment for research projects, such as our immersive virtual reality suite, and motion capture facilities, 3D printing and surface computing facilities. As one of four partners in the National Active Learning in Computing: Centre of Excellence in Teaching and Learning Project, we are able to provide state-of-the-art video conferencing, and technologies for conference and collaborative learning. We also provide you with access to a secure web-based system to help with many of the day-to-day aspects of your academic life, such as course work submissions, and retrieving assessment grades and feedback.

Professional accreditation

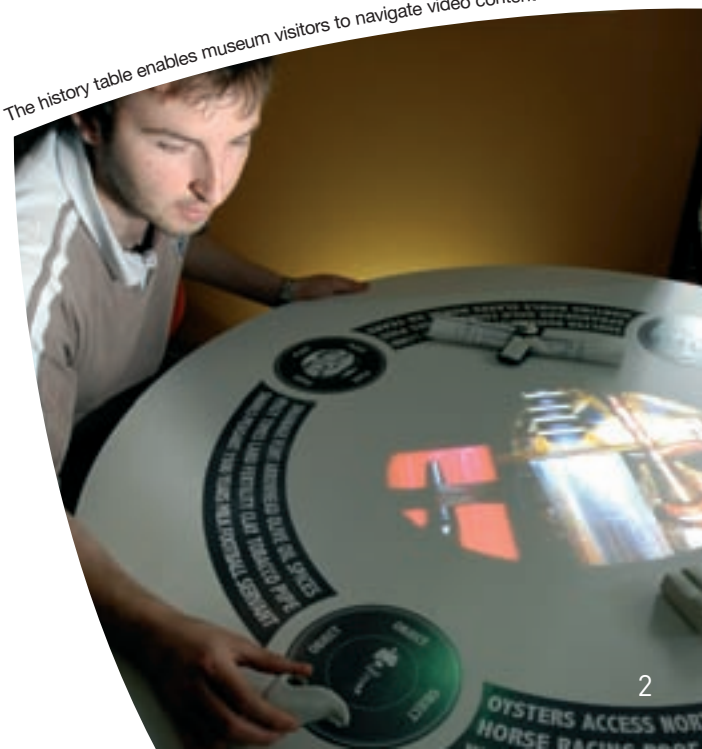
Our degree programmes are accredited by the British Computer Society, which exempts you from further examinations if you decide to apply for Chartered Engineering status after graduating. For further information visit **www.bcs.org**

Links with industry

If you wish to spend a year in industry between your second and final years, we offer a number of degrees that include this option. The School has many contacts with local, national and international industry and will help you make suitable arrangements for your year out.

Several companies provide input to our degree programmes through specific modules and team projects, and various parts of our programmes attract prizes awarded by major companies and organisations, including the British Computer Society, British Airways, Logica and IBM.

The history table enables museum visitors to navigate video content.



Computing Science degrees



Computing Science BSc Honours
UCAS code G400 (3 years)

Computing Science with Industrial Placement BSc Honours
UCAS code G401 (4 years)

Computing Science (Networked Systems and Internet Technologies) BSc Honours
UCAS code G420 (3 years)

Computing Science with Industrial Placement (Networked Systems and Internet Technologies) BSc Honours
UCAS code G421 (4 years)

Computing Science (Games and Virtual Environments) BSc Honours
UCAS code G450 (3 years)

Computing Science with Industrial Placement (Games and Virtual Environments) BSc Honours
UCAS code G451 (4 years)

Computing Science (Software Engineering) BSc Honours
UCAS code G600 (3 years)

Computing Science with Industrial Placement (Software Engineering) BSc Honours
UCAS code G603 (4 years)

These degrees share a common Stage 1 (first year) and Stage 2 (second year), so it is possible to transfer between the programmes at any time before the start of Stage 3 (final year). During Stage 1 you learn about the fundamentals of object-oriented programming, software engineering and data structures. You also take modules covering mathematics (at a level reflecting your previous experience), hardware and computer architecture, the interface to computer systems, the social impact of computing and the role of the professional in the computing and IT industry.

At Stage 2 you continue to develop your programming skills to include functional and event-driven programming in the context of the client/server model. You also complete a team project, which gives you experience of collaborative work and of project management. Each team is involved in design, planning and organisation, as well as co-ordinating the integration of software. Further modules reinforce your theoretical understanding of computer science.

In Stage 3 all students undertake an individual project (one third of your time). Project topics vary widely but often relate closely to the research interests of a member of academic staff. Most years a number of students publish the results of their project work at international computer science workshops and conferences.

The remaining modules in Stage 3 are optional and you can choose these from a wide selection that reflects current developments in computing science. Your final degree title will be determined by your choice of modules at Stage 3.

Stage 1

The IT professional in today's society (20) outlines the impact that computers and other technologies have had on modern life and culture, and explores the wider issues of being a professional in the IT industry.

Introduction to problem solving and programming (20) explores the concept of using computer programs to solve problems, and introduces the fundamental aspects of object-oriented programming and software engineering.

World Wide Web and its client-side technologies (20) provides an introduction to the various technologies used by the World Wide Web and the importance of the various standards that are in place.

Computer system organisation (20) identifies concepts underpinning modern networked computing and the wide range of systems software and other software-based computing tools that collectively provide a computing environment.

Mathematics for computing science (20) introduces the mathematical concepts essential for study and professional practice in computing science.

Object-orientated programming (20) introduces fundamental data structures and algorithms for organising collections of data, which are then used as building blocks for more sophisticated programming.

Stage 2

Algorithm design and analysis (20); Database technology (20); Advanced programming (20); Computer systems and networks (20); Modelling and computation (20); Software engineering team project (20).

Industrial placement year for relevant programmes

Stage 3

Project and dissertation (40).

For **Computing Science** 80 credits of optional modules are selected from: Distributed systems (10); Internet technologies and e-commerce (10); Middleware and web services (10); System and network security (10); Graphics (10); Advanced graphics and virtual environments (10); Artificial intelligence for games (10); Computer games development (10); Software architecture (10); Software development, technologies and tools (20); Software project management (10); and Graphical user interfaces (10).

For **Computing Science (Networked Systems and Internet Technologies)** compulsory modules include: Distributed systems (10); Internet technologies and e-commerce (10); Middleware and web services (10); System and network security (10).

For **Computing Science (Games and Virtual Environments)** compulsory modules include: Graphics (10); Advanced graphics and virtual environments (10); Artificial intelligence for games (10); Computer games development (10).

For **Computing Science (Software Engineering)** compulsory modules include: Software architecture (10); Software development, technologies and tools (20); Software project management (10).

> "All the modules are very well prepared, and lecturers are centrally based, meaning communication and contact are very simple!"
>
> **Daniel**, Computing Science (Software Engineering) BSc Honours

Please note: at each Stage you complete modules to the value of 120 credits, and the credit value of each module is given in brackets. Modules are subject to additions and amendments on an annual basis.

Information Systems degrees

Information Systems BSc Honours
UCAS code G500 (3 years)

Information Systems (Industrial Placement) BSc Honours
UCAS code G504 (4 years)

Information Systems with Business Studies BSc Honours
UCAS code G5N1 (3 years)

Information Systems with Business Studies (Industrial Placement) BSc Honours
UCAS code G5NC (4 years)

Information Systems with Management BSc Honours
UCAS code G5N2 (3 years)

Information Systems with Management (Industrial Placement) BSc Honours
UCAS code G5NF (4 years)



Programming robots as part of a Stage 3 module on real-time systems.

Information technology (IT) underpins many aspects of today's commercial and industrial world. These degrees seek to develop graduates with advanced skills in IT who have a breadth of knowledge in application areas such as economics, business studies, management, law, and/or language skills relevant to international commerce. There is sufficient overlap with the computing science programmes in Stage 1 (first year) to permit transfer from those degrees to an information systems degree at the end of Stage 1 (but not vice versa).

In Stage 1 you concentrate on developing essential information systems (IS) skills, and you spend one third of your time acquiring skills in other subjects; options include modern languages, accounting, economics, business management, and law.

In Stage 2 (second year) you build on the IS skills developed during Stage 1, with a key component being the interaction with computer users at all levels and in different forms. You also continue to spend a third of your time studying modules in other subjects, normally the same subjects as those studied in Stage 1.

Stage 3 (final year) provides you with further experience in aspects of IS development and support, such as software project management and system administration. In addition, you undertake an individual project that gives you the opportunity to demonstrate that you can apply your IS skills. A third of your time will again be devoted to other topics, normally taking advanced modules in those subjects studied in previous Stages.

> 'The facilities within the School are fantastic and are always being updated to keep up with changes in technology.'
>
> **Helen**, Information Systems BSc Honours

Stage 1

The IT professional in today's society (20) outlines the impact that computers and other technologies have had on modern life and culture, and explores the wider issues of being a professional in the IT industry.

Introduction to problem solving and programming (20) explores the concept of using computer programs to solve problems, and introduces the fundamental aspects of object-oriented programming and software engineering.

World Wide Web and its client-side technologies (20) provides an introduction to the various technologies used by the World Wide Web and the importance of the various standards that are in place.

Computer system organisation (20) identifies concepts underpinning modern networked computing and the wide range of systems software and other software-based computing tools that collectively provide a computing environment.

Additional subject modules (40) chosen from another subject such as a modern foreign language, accounting, economics, business studies or management.

Stage 2

Software engineering team project (20); Information management (20); Database systems (20); World Wide Web and its server-side technologies (20); Additional subject modules (40).

Industrial placement year for relevant programmes

Stage 3

Information systems project and dissertation (40).
Human–computer interaction (10); Software project management (10); System administration (10).
Further information systems modules (10) chosen from: Graphical user interfaces; Reliability and fault tolerance; Evolution of complex systems; Web design principles and practice.
Additional subject modules (40): if you take 40 credits each year in modules related to accounting, business studies or management, then this is reflected in your degree title.

Please note: at each Stage you complete modules to the value of 120 credits, and the credit value of each module is given in brackets. Modules are subject to additions and amendments on an annual basis.



Multi-user media sharing, using mobile phones and table-top interfaces – developed as part of a final-year project.



Experimenting with sound as part of a Stage 3 project.

> My lecturers are all leaders in their respective fields, and the School of Computing Science itself is nationally recognised. The teaching staff transfer their passion for the subject to every lecture, seminar and practical class.

Phillip, Computing Science BSc Honours



Teaching and assessment

Our degree programmes extend over three Stages, with each Stage corresponding to one academic year. The academic year is divided into two semesters, with an assessment period at the end of each semester.

Teaching is by a combination of lectures, tutorials (small group and one-to-one) and practical classes, and we place a lot of importance on the development of transferable skills that will be of use to you throughout your career. We introduce you to the broader issues of being a professional computer scientist/software engineer through speakers from other areas of the University as well as from the wider information systems community.

Assessment includes written examinations, but all modules involve the development of practical skills through course work, which contributes significantly to your final mark. All degree programmes involve a team project in Stage 2, and an individual project in Stage 3, that gives you the opportunity to examine a topic in depth and to undertake substantial amounts of practical work. Though you must pass all Stages, your final degree classification is based on your performance in Stages 2 and 3.

Careers

According to the British Computing Society, there is still a significant shortage of computing science graduates. Of course, as a graduate of one of the UK's leading centres for computing science, you will be in an excellent position to find a job after graduation.

There are many different roles for computing science graduates in industry. In the present job market, our computing graduates are well placed to obtain employment in a challenging and fulfilling career. They take up positions as programmers, application and system developers, analysts, IT consultants, technical support advisers, website developers, and specialist and research software engineers. Computing manufacturers and software houses recruit specialists to develop software solutions, while organisations that use computers on a large scale, such as banks, insurance companies, the electronics industry and central and local government, also offer employment opportunities to graduates with computing skills. Graduates in the IT sector continue to earn salaries well above the average for new graduates. Some of our graduates continue with their studies as postgraduate students.

Academic qualifications are not all that employers are looking for. At Newcastle, we provide an extensive range of opportunities through ncl+ to enable you to develop personal, employability and enterprise skills, and to give you a real edge in the employment market after you graduate.

Our award-winning Careers Service will support you throughout your degree and for up to three years after graduation. One of the largest careers services in the UK, they work with over 80 of the employers in *The Times* newspaper's Top 100 Graduate Employers list.

For more information about the employability of our graduates, see: **www.ncl.ac.uk/undergraduate/careers**

You may also be interested in...

Electronics and Computer Engineering
MEng Honours UCAS code H654
BEng Honours UCAS code H652
(*Electrical, Electronic and Computer Engineering* brochure)

To order the above brochure visit:
www.ncl.ac.uk/requests

We are continually reviewing and updating the range of degrees that we offer to fit with market needs. To find out which degree programmes we have recently introduced see:
www.ncl.ac.uk/undergraduate/degrees/new

"A qualification from a well-respected institution like Newcastle is a very impressive addition to your CV; the University's reputation is a definite bonus. I used the University Careers Service to find information about available jobs; they helped me apply for part-time jobs whilst I was at University and pointed me in the right direction for graduate jobs after I finished my degree."

Carl, Computing Science BSc and Bioinformatics MRes graduate

Entrance requirements

We recognise that students will apply to our degree programmes with a range of qualifications. We consider each applicant on an individual basis, taking into account the information on your UCAS application including past academic performance and potential. The following information gives an indication of the type and level of entrance requirements, but we encourage you to contact us if you require any further details or clarification. We are happy to accept deferred entry.

Computing Science BSc Honours
Computing Science (Networked Systems and Internet Technologies) BSc Honours
Computing Science (Games and Virtual Environments) BSc Honours
Computing Science (Software Engineering) BSc Honours
Computing Science with Industrial Placement BSc Honours
Computing Science with Industrial Placement (Networked Systems and Internet Technologies) BSc Honours
Computing Science with Industrial Placement (Games and Virtual Environments) BSc Honours
Computing Science with Industrial Placement (Software Engineering) BSc Honours

A levels: ABC/BBB. GCSE Mathematics at grade B is also required.
Scottish qualifications: BBBBB at Higher Grade. Mathematics is required at grade 2 Standard Grade (or Intermediate 2 equivalent) if not offered at Higher Grade. Combinations of Highers and Advanced Highers are accepted.
International Baccalaureate: 30 points. Standard Level Mathematics or Mathematical Studies required at grade 5 if not offered at Higher Level.

Information Systems BSc Honours
Information Systems with Business Studies BSc Honours
Information Systems with Management BSc Honours
Information Systems (Industrial Placement) BSc Honours
Information Systems with Business Studies (Industrial Placement) BSc Honours
Information Systems with Management (Industrial Placement) BSc Honours

A levels: BBC. GCSE Mathematics at grade C is also required.
Scottish qualifications: BBBBC at Higher Grade. Mathematics is required at grade 2 Standard Grade (or Intermediate 2 equivalent) if not offered at Higher Grade. Combinations of Highers and Advanced Highers are accepted.
International Baccalaureate: 28 points. Standard Level Mathematics or Mathematical Studies required at grade 4 if not offered at Higher Level.

We also welcome applications from students with equivalent qualifications, including Access to HE Diplomas, BTEC National Diploma and a full range of European and international qualifications. We are pleased to advise anyone interested with regard to an appropriate preparatory course of study. Entrance requirements can vary from year to year, so you should check the University's website for up-to-date details.
www.ncl.ac.uk/ug/comp.sci

You should also visit our School website for more information at: **study.cs.ncl.ac.uk**



International students

Newcastle University is home to a diverse and cosmopolitan community, with over 3,300 international students from more than 110 countries worldwide. With a well-established and dedicated support and advice service, Newcastle has everything you need for a successful and enjoyable student experience. Find out more at: **www.ncl.ac.uk/international**

Student finance (UK/EU)

For more information on tuition fees, bursaries and scholarships, please see **www.ncl.ac.uk/undergraduate/finance** or contact Student Services for a copy of our *Guide to Student Finance*.

Disabled students

We welcome applications from students with disabilities and this brochure is available on request in alternative formats from Student Services. Disability Support provides help and advice whilst you are at the University, and makes every effort to provide a suitable learning environment for you. To discuss the facilities on campus and any specific requirements you may have, contact:

Student Wellbeing Service (Disability Support)
Telephone: (UK) 0191 222 7699
(International) +44 191 222 7699
Fax: (UK) 0191 222 5909
(International) +44 191 222 5909
E-mail: studentwellbeingservice@ncl.ac.uk
www.ncl.ac.uk/students/wellbeing

An ambient kitchen using various pervasive computing techniques, developed to assist people with mobility and memory problems.



Further information

If you have any questions about the degree programmes outlined in this brochure please contact:

School of Computing Science
Claremont Tower
Newcastle University
Newcastle upon Tyne NE1 7RU
Telephone: (UK) 0191 222 8072
(International) +44 191 222 8072
E-mail: cs.admissions@ncl.ac.uk
study.cs.ncl.ac.uk

To find out more about the University and its facilities, including accommodation, sports and social activities, or the city and surrounding area, you should take a look at the University's website or request a copy of the *Undergraduate Prospectus* from: **www.ncl.ac.uk/undergraduate**

Student Services
Newcastle University, King's Gate
Newcastle upon Tyne NE1 7RU
United Kingdom
Telephone: (UK) 0191 208 3333
(International) +44 191 208 3333
Enquire online: **www.ncl.ac.uk/enquiries**

Visiting the University

We hold a number of admissions days where you have the opportunity to meet staff and students and see our teaching and research facilities at first hand. Financial support for travel to admissions days is provided.

If you would like to visit the University before you apply, our Visit Days offer subject talks, an information fair and tours of the campus and accommodation. If we make you an offer, open days for your subject area give you the opportunity to talk to current students and members of staff. You can discuss the degree programmes as well as seeing the University and its facilities. **www.ncl.ac.uk/undergraduate/visit**

We would like to thank the following for the use of their illustrative material: John Donoghue; Jim McAdam; Keith Pattison.

Details are correct at the time of printing (April 2010) but should be checked against the current edition of the *Undergraduate Prospectus* or on the University's website. Details contained in this brochure are for information and guidance purposes only.

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The University of Newcastle upon Tyne trading as Newcastle University.