University of Birmingham

Computer Science MSci

Undergraduate degree course in Computer Science MSci I101:

During this course you will learn about all kinds of computational systems, their theory, design, development and application. This includes programming languages, software engineering, artificial intelligence, operating systems, databases, nature-inspired computation, concurrent computing, robotics and the theory of computation. The degree incorporates concepts from fields as diverse as mathematics, engineering, linguistics and psychology.

Computer scientists design and create search-engines, social networking applications, software applications used in the financial world to map customer profiles and expose credit card fraud, and software applications used in the medical sector to identify cancers through the analysis of medical images.

At a deeper scientific/mathematical level, we look at the theory underpinning complex algorithms, or the difficulty of implementing solutions to complex problems in a provably reliable way. At the engineering level, we ensure that complex systems are built to appropriate standards, are properly tested and run efficiently. Then at the human level, we ensure that applications are easy to learn and use and are well matched to functional expectations.

At Birmingham, we have world-leading research in terms of originality, significance and rigour. We provide specialist teaching and are committed to supporting our graduates in establishing their careers.

The School of Computer Science is committed to the student experience, offering student alumni mentoring, a dedicated welfare team and a dedicated careers and employability officer. We're keen to welcome you to our friendly, inclusive and multi-faceted School.

Study here and find out why the University of Birmingham was awarded The Times and The Sunday Times University of the Year 2013-14 (http://www.birmingham.ac.uk/news/latest/2013/09/20-sep-Birmingham-announced-as-University-of-the-Year.aspx)

Course fact file

UCAS code: I101

Duration: 4 years

Places Available: 130 (Total number of places for all Computer Science courses)

Applications in 2014: 1140

Typical Offer: A*AA (**More detailed entry requirements and the international qualifications accepted can be found in the course details (?OpenSection=EntryRequirements)**)

Start date: September

Related courses

Computer Science with an Industrial Year MSci (/undergraduate/courses/computer-science/computer-science-industry-msci.aspx)

Computer Science with Study Abroad MSci (/undergraduate/courses/computer-science/computer-science-international-msci.aspx)

Contact

Admissions Tutor: Dr John Bullinaria
Telephone enquiries: +44 (0)121 415 8742
Email: **ug-admissions@cs.bham.ac.uk (mailto:ug-admissions@cs.bham.ac.uk)**

School of Computer Science (/schools/computer-science/index.aspx)

Follow us on Twitter (http://twitter.com/eps_unibham)

Details

This three-year programme has a student satisfaction rating of 95%.

The MSci in Computer Science is a four year single honours degree programme. Following the first two years, where course content is the same as the BSc Computer Science, in their third year students spend a quarter of their time on a project. In their fourth year students have the unique opportunity to select modules from the School's portfolio of Masters programmes and even to specialise in a particular field at Masters level. In their final year, students undertake an in-depth software project.

The course is designed to provide thorough coverage of Computer Science's core areas giving students a systematic grounding in both the theoretical underpinnings of the discipline and practical software development.

First year

Through compulsory and optional modules you will gain a firm foundation in the principles of algorithms, artificial intelligence, software engineering and relevant mathematics. You also learn in-depth computer programming in Java – a language widely used in business.

Second year

You progress to studying enabling technologies such as databases, graphics and the formal basis of programming languages. These are taught in conjunction with programming which gives you a much deeper understanding through the implementation of techniques. As part of a team you produce software, and learn new styles of programming in Java and a second language from a different programming language paradigm. You also select modules from a range of options which cover core computer science, programming languages and artificial intelligence. .

Third year

You are able to pick eight modules from a wide selection. You may choose to study subjects relevant to industry, for example computer networks, distributed systems or commercial programming. Alternatively you may prefer to focus on current research in areas such as evolutionary computation, neural computation, intelligent robotics and natural language technologies.

One third of your time will be devoted to a project which will give you the opportunity to write a large piece of software and to apply the computing skills you have acquired so far.

Fourth year

In the final year modules from our range of Masters programmes will be open to you. You will also undertake a much more in-depth software project. Your choice of modules alongside your choice of project will allow you to specialise in a field such as Computer Security, Human Computer Interaction, Robotics or Natural Computation.

On completion of the course, in addition to holding a Masters level qualification, students will be well-equipped for a career as a Computer Science professional. They will also have developed transferable skills in numeracy, problem solving, team-working, general communication, and information technology. The MSci Computer Science can be taken with a year in industry or a year abroad.

Related links

School of Computer Science website: **www.cs.bham.ac.uk (http://www.cs.bham.ac.uk/)**

Why study this course

Computer Science is a dynamic discipline. What began with the curiosity of only a handful of academics has blossomed into a field with an impact on our lives that would have astonished most of the pioneers. In the past 50 years computers have contributed to numerous advances in almost every field, and Computer Science now provides the foundations for the information processing and communication systems that are at the heart of today?s world. Future changes in computing and communications technologies will depend on advances in this science and the rate of progress shows no signs of slowing down.

At the University of Birmingham, you?ll benefit from an industry-informed curriculum that is accredited by the British Computer Society (BCS) and the Institute of Engineering Technology (IET). You?ll have the opportunity to develop a high level of practical skills and build specialist knowledge in applied computer science, with the flexibility to follow your own interests through the choice of optional modules.

All our undergraduate degree programmes are available with a Year in Industry; an excellent opportunity to supplement your studies with paid work in the real world, and many of our students go on to work for their year-out employers after graduating.; an excellent opportunity to supplement your studies with paid work in the real world, and many of our students go on to work for their year-out employers after graduating.

The University of Birmingham is world-renowned for the quality of its research and we?re home to a number of centres of excellence, including:

- Cercia, working at the cutting-edge of Computational Intelligence (CI) research
- The Centre for Computational Neuroscience and Cognitive Robotics (CN-CR), which combines research on human cognition, sensory and motor systems, and computational modelling with research on robotic systems, leading towards a better understanding of both brain function and advanced robotics with , leading towards a better understanding of both brain function and advanced robotics
- The Human-Computer Interaction Research Centre, which leads the development of our understanding on how people interact with technologies, and how one transforms the othe

Modules

Course Modules

Please note that actual course modules may vary from year to year, however, the following are typical course modules:

Compulsory Modules

- **Foundations of Computer Science (http://www.cs.bham.ac.uk/internal/modules/2012/22754)**
- **Information & the Web (http://www.cs.bham.ac.uk/internal/modules/2012/21156)**
- **Introduction to AI (http://www.cs.bham.ac.uk/internal/modules/2012/23069)**
- **Introduction to Software Engineering (http://www.cs.bham.ac.uk/internal/modules/2012/11224)**
- **Language & Logic (http://www.cs.bham.ac.uk/internal/modules/2012/21155)**
- **Robot Programming (http://www.cs.bham.ac.uk/internal/modules/2012/22382)**
- **Software Workshop 1 (http://www.cs.bham.ac.uk/internal/modules/2012/18190)**
- **Professional Computing (http://www.cs.bham.ac.uk/internal/modules/2012/25345)**
- **Mathematical Techniques for Computer Science (http://www.cs.bham.ac.uk/internal/modules/2012/21254)**
- **Models of Computation (http://www.cs.bham.ac.uk/internal/modules/2012/05934)**
- **Software System Components A (http://www.cs.bham.ac.uk/internal/modules/2012/19321)**
- **Software System Components B (http://www.cs.bham.ac.uk/internal/modules/2012/19343)**
- **Software Workshop Team Java (http://www.cs.bham.ac.uk/internal/modules/2012/08165)**
- **Software Project (http://www.cs.bham.ac.uk/internal/modules/2012/02386)**
- **Software Design Study (http://www.cs.bham.ac.uk/internal/modules/2012/15500)**

Optional Modules

- Introduction to Mathematics for Computer Science (http://www.cs.bham.ac.uk/internal/modules/2012/20415)
- Computational Vision (http://www.cs.bham.ac.uk/internal/modules/2012/19339)
- Computer Systems & Architecture (http://www.cs.bham.ac.uk/internal/modules/2012/19340)
- Functional Programming (http://www.cs.bham.ac.uk/internal/modules/2012/25344)
- Introduction to Natural Computation (http://www.cs.bham.ac.uk/internal/modules/2012/19341)
- Machine Learning (http://www.cs.bham.ac.uk/internal/modules/2012/02640)
- Natural Language Processing 1 (http://www.cs.bham.ac.uk/internal/modules/2012/02495)
- Software Engineering (http://www.cs.bham.ac.uk/internal/modules/2012/18191)
- Logic Programming (http://www.cs.bham.ac.uk/internal/modules/2012/02630)
- Automatic Verification (http://www.cs.bham.ac.uk/internal/modules/2012/02489)
- Commercial Programming (http://www.cs.bham.ac.uk/internal/modules/2012/02363)
- Compilers & Languages (http://www.cs.bham.ac.uk/internal/modules/2012/02578)
- Databases 2 (http://www.cs.bham.ac.uk/internal/modules/2012/02525)
- Evolutionary Computation (http://www.cs.bham.ac.uk/internal/modules/2012/02411)
- Formal Methods (http://www.cs.bham.ac.uk/internal/modules/2012/08144)
- Graphics 2 (http://www.cs.bham.ac.uk/internal/modules/2012/02408)
- Human Computer Interaction (http://www.cs.bham.ac.uk/internal/modules/2012/22133)
- Individual Study 1 (http://www.cs.bham.ac.uk/internal/modules/2012/15506)
- Intelligent Data Analysis (http://www.cs.bham.ac.uk/internal/modules/2012/20122)
- Intelligent Robotics (http://www.cs.bham.ac.uk/internal/modules/2012/13520)
- Natural Language Processing & Applications (http://www.cs.bham.ac.uk/internal/modules/2012/11223)
- Nature Inspired Design (A) (http://www.cs.bham.ac.uk/internal/modules/2012/14410)
- Networks and Distributed Systems (http://www.cs.bham.ac.uk/internal/modules/2012/23644)
- Neural Computation (http://www.cs.bham.ac.uk/internal/modules/2012/20416)
- Operating Systems with C/C++ (http://www.cs.bham.ac.uk/internal/modules/2012/23636)
- Parallel Programming (http://www.cs.bham.ac.uk/internal/modules/2012/24450)
- Planning (http://www.cs.bham.ac.uk/internal/modules/2012/02562)
- Principles of Programming Languages (http://www.cs.bham.ac.uk/internal/modules/2012/02552)
- Virtual Reality (http://www.cs.bham.ac.uk/internal/modules/2012/02645)
- Modules Outside the Main Discipline (http://www.cs.bham.ac.uk/internal/modules/2012/momd1)
- L2 language modules (http://www.cs.bham.ac.uk/internal/modules/2012/lang2)
- L3 language modules (http://www.cs.bham.ac.uk/internal/modules/2012/lang3)
- Compilers & Languages (Extended) (http://www.cs.bham.ac.uk/internal/modules/2012/15255)
- Component-based Software (http://www.cs.bham.ac.uk/internal/modules/2012/18157)
- Computational Modelling with MATLAB (http://www.cs.bham.ac.uk/internal/modules/2012/23836)
- Computer Security (http://www.cs.bham.ac.uk/internal/modules/2012/23899)
- Cryptography (http://www.cs.bham.ac.uk/internal/modules/2012/20008)
- Individual Study 2 (http://www.cs.bham.ac.uk/internal/modules/2012/19009)
- Intelligent Data Analysis (Extended) (http://www.cs.bham.ac.uk/internal/modules/2012/20233)
- Intelligent Robotics (Extended) (http://www.cs.bham.ac.uk/internal/modules/2012/15267)
- Introduction to Evolutionary Computation (http://www.cs.bham.ac.uk/internal/modules/2012/22753)
- Introduction to Neural Computation (http://www.cs.bham.ac.uk/internal/modules/2012/12412)
- Machine Learning (Extended) (http://www.cs.bham.ac.uk/internal/modules/2012/20236)
- Nature Inspired Design (http://www.cs.bham.ac.uk/internal/modules/2012/12418)
- Networks and Distributed Systems (Extended) (http://www.cs.bham.ac.uk/internal/modules/2012/23640)
- Network Security (http://www.cs.bham.ac.uk/internal/modules/2012/23900)
- Operating Systems with C/C++ (Extended) (http://www.cs.bham.ac.uk/internal/modules/2012/23635)
- Parallel Programming (Extended) (http://www.cs.bham.ac.uk/internal/modules/2012/22755)
- Planning (Extended) (http://www.cs.bham.ac.uk/internal/modules/2012/20234)
- Secure Programming (http://www.cs.bham.ac.uk/internal/modules/2012/20010)
- Software Testing (http://www.cs.bham.ac.uk/internal/modules/2012/18158)
- Modules Outside the Main Discipline (http://www.cs.bham.ac.uk/internal/modules/2012/momd1)

Fees and funding

Standard fees (http://www.birmingham.ac.uk/students/ug/courses/fees/standard) apply.
Learn more about fees and funding (/undergraduate/fees/loans.aspx) .

Scholarships
Please see **www.cs.bham.ac.uk/admissions/undergraduate/scholarships.php (http://www.cs.bham.ac.uk/admissions/undergraduate/scholarships.php)** for scholarships in Computer Science.
Learn more about our **scholarships and awards (/undergraduate/fees/funding/index.aspx)** .

Entry requirements

Number of A levels required: 3

Typical offer: A*AA

Required subjects and grades: Mathematics or Computing must be offered at A Level. We also require Grade B in GCSE Mathematics (if not offered at A Level) and Grade C in GCSE English.

General Studies: or Critical Thinking not accepted.

Additional information:

- It is desirable, but not essential, to have some experience of writing computer programs.
- A subject booklet is available from the School on request.
- This degree can be taken with a year in industry.
- This degree can be taken with a year of study abroad.
- We accept other qualifications from the UK and overseas. Please contact the Admissions Tutor for more information.

International students:

International Baccalaureate Diploma: 36 points including 7 in HL Mathematics or Computing. We also require 5 in SL Mathematics (if not offered at HL) and 5 in SL English

Standard English language requirements apply.
Learn more about **international entry requirements (http://www.birmingham.ac.uk/students/ug/requirements/international)** .

Depending on your chosen course of study, you may also be interested in the Birmingham Foundation Academy, a specially structured programme for international students whose qualifications are not accepted for direct entry to UK universities. Further details can be found on the **foundation academy web pages (http://www.birmingham.ac.uk/students/foundation-academy/Pathways/index.aspx)** .

How to apply

Apply through UCAS at **www.ucas.com (http://www.ucas.com/)** .
Learn more about **applying (http://www.birmingham.ac.uk/students/ug/courses/apply)** .

Key Information Set (KIS)

Key Information Sets (KIS) are comparable sets of information about full- or part-time undergraduate courses and are designed to meet the information needs of prospective students.

All KIS information has been published on the Unistats website and can also be accessed via the small advert, or 'widget', below. On the **Unistats website (http://unistats.direct.gov.uk)** you are able to compare all the KIS data for each course with data for other courses.

The development of Key Information Sets (KIS) formed part of HEFCE's work to enhance the information that is available about higher education. They give you access to reliable and comparable information in order to help you make informed decisions about what and where to study.

The KIS contains information which prospective students have identified as useful, such as student satisfaction, graduate outcomes, learning and teaching activities, assessment methods, tuition fees and student finance, accommodation and professional accreditation.

Related news and events

Social media: why the case for teaching digital literacy is so compelling (/news/thebirminghambrief/items/2013/08/14-08-13Social-media-why-the-case-for-teaching-digital-literacy-is-so-compelling.aspx)

Learning and teaching

How will I be taught?
As a Birmingham student, you are joining the academic elite and have the privilege of learning from world-leading experts in the field of computer science. Throughout your studies, you'll be encouraged to become an independent and self-motivated learner, thriving on challenge and opportunities to think for yourself.

Personal tutor
At the start of your degree, you'll be assigned a Personal Tutor who will remain with you throughout your studies to help you in three important areas: supporting your academic progress, developing transferable skills and dealing with any welfare issues.

Contact hours
In your first year the course is delivered via lectures, tutorials, workshops, laboratory classes and self-directed learning, including revision and working on exercises. As you proceed through your course the number of structured hours decreases and there's a strong emphasis on project work in your final year. The range of projects in your final year includes practical work in the laboratory, computer-based projects, or theoretical studies. Education-based projects are also available to those interested in entering the teaching profession. Lecturers provide a pool of topics for final year projects, however, you are strongly encouraged to come up with your own ideas.

Learning settings:

Laboratory-based work is an integral part of our Computer Science degree programme, vital to develop your experimental practical skills and to reinforce concepts introduced in lectures or to explore a particular phenomenon. First-year practical sessions typically last for four hours and increase in length in subsequent years so that you can study more advanced concepts and work more independently.

Lectures take place in our theatres which, as well as the traditional whiteboard and pen, are equipped with the latest technology, including facilities to show movies, animations and molecular graphics, to record lectures and to interact with 'ask the audience' style electronic voting systems.

Small-group tutorials/personal tutorials run alongside the lecture course, addressing any individual problems you may have and allowing you to consolidate lecture material, as well as test your understanding through problem-solving exercises.

Enquiry Based Learning (EBL) is a group activity which requires you to work in a team, with a variety of assessment methods; in either a group or individually, by written reports and sometimes as a presentation. Based on techniques used in research-led organisations like the University of Birmingham, EBL gives you a research-orientated approach to a problem and helps you to gain essential skills that are highly valued by employers.

Assessment methods

Each module is assessed independently with all containing some components of continuous assessment, which usually accounts for about a fifth to a third of your marks. Some modules are completely assessed by coursework. Assessment methods include end-of-year examinations in May and June, written assignments, oral and poster presentations, computer-based tests, marked exercises, and laboratory and project reports.

During your first year you will undergo a formal 'transition' review to see how you are getting on and whether there are particular areas where you need support. This is in addition to the personal tutor who is based in your School or Department and can help with any academic issues you encounter.

Feedback is an essential part of learning and we use a wide range of methods, such as written feedback on your assessments, class feedback sessions and discussions with your tutor. You'll receive feedback on each assessment within four weeks, highlighting the positives of your work as well as any areas that need more attention. You will also be given feedback on any exams that you take; if you fail an exam we will ensure that you receive particularly detailed feedback to enable you to learn for the future.

Employability

On average, 90% of the students graduating from this course go straight into work and/or further study after graduation. Of those in work, 95% are in professional or managerial jobs and typically earning in the range ?21,000-?31,000 pa six months after graduation.

Preparaing for your career is one of the first things you need to think about when you start university. Our Computer Science graduates can choose from a huge variety of career opportunities, including working with one of the global technology giants, or in other areas of industry and technology. But you'll also be highly sought after by employers in the fields of finance, business, government, teaching and research.

At the University of Birmingham, we also enhance your employability with superb opportunities to gain industry experience, assisting you to secure mentoring opportunities, global internships and placements, from summer jobs to spending a whole year in industry between your second and final study years. This placement year is a chance to earn money and gain real-life experience, allowing you to get involved in serious projects and put into practice the skills and knowledge gained from your degree. It's a great chance to prove your worth and placements often lead to sponsorship and/or the offer of a graduate job.

Whether you have a clear idea of where your future aspirations lie or want to consider the broad range of opportunities available once you have a Birmingham degree, our Careers Network can help you achieve your goal.

Our unique careers guidance service is tailored to your academic subject area, offering a specialised team (in each of the five academic colleges) who can give you expert advice. Once you have a career in your sights, one-to-one support with CVs and job applications will help give you the edge. In addition, our employer-endorsed award-winning **Personal Skills Award (PSA) (https://intranet.birmingham.ac.uk/as/employability/psa/index.aspx)** recognises your extra-curricular activities, and provides an accredited employability programme designed to improve your career prospects.

Your Birmingham degree is evidence of your ability to succeed in a demanding academic environment. Employers target Birmingham students for their drive, diversity, communication and problem-solving skills, their team-working abilities and cultural awareness, and our graduate employment statistics have continued to climb at a rate well above national trends. If you make the most of the wide range of services you will be able to develop your career from the moment you arrive.

Career destinations of previous graduates include:

- Accenture
- Goldman Sachs
- Honda
- HP
- IBM
- Logics
- QinetiQ
- Rolls Royce
- UBS

University Careers Network

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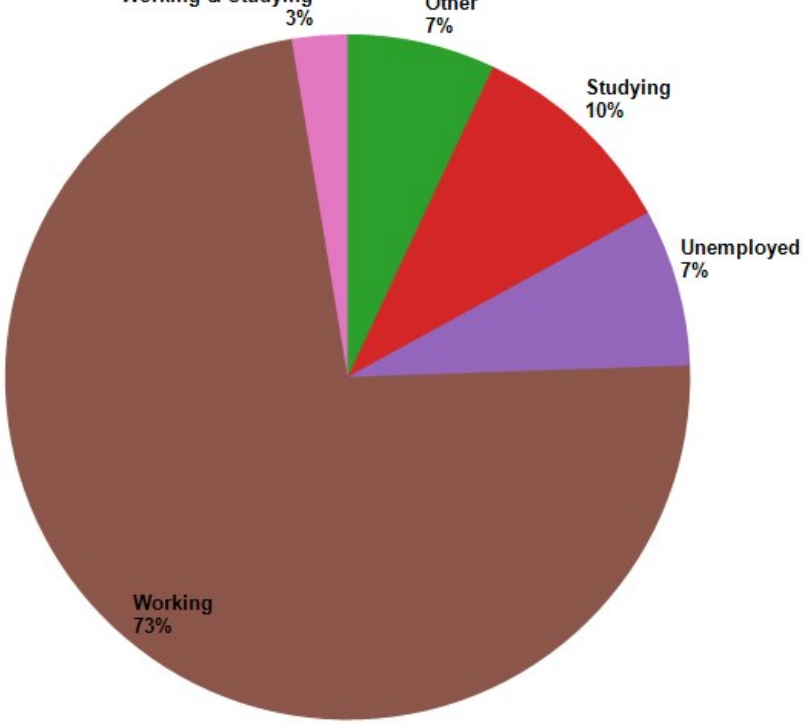
If you make the most of the **wide range of services (https://intranet.birmingham.ac.uk/as/employability/careers/college/eps/index.aspx)** you will be able to develop your career from the moment you arrive.

Destinations of Leavers from Higher Education (DLHE) 2011/12

The DLHE survey is conducted 6 months after graduation.

Examples of occupations

- Software Engineer



- Software Developer
- Technical Analyst
- Applications Developer
- Cyber Security Consultant
- Design Engineer
- Junior Programmer
- Software Consultant
- Technical Consultant
- Technology Analyst

Further study - examples of courses

- MSc Computer Security
- MSc International Business
- MEng Aeronautics & Astronautics
- MSc Computer Science
- MSc Artifical Intelligence
- MSc Operational Research
- MSc Imbedded Systems
- PhD - Physical Sciences in the Biomedical Imaging
- PhD - Computer Science

Visit the **Careers section of the University website** **(https://intranet.birmingham.ac.uk/as/employability/careers/college/eps/index.aspx)** for further information.

Professional accreditation

This new course will be assessed for accreditation February 2013.

97% Students agreed staff are good at explaining things

MSci (Hons) Computer Science
Full time

To see more details and compare with other courses

Visit UNISTATS

Official data collected by HEFCE

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