University of Birmingham

Artificial Intelligence and Computer Science BSc with a year in industry

Undergraduate degree course in Artificial Intelligence and Computer Science BSc with a year in industry – GG74:

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.

Course fact file

UCAS code: GG74

Duration: 4 years (with a year in industry)

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

Applications in 2014: 1140

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

Start date: September

Related courses

Artificial Intelligence and Computer Science BSc (/undergraduate/courses/computer-science/artificial-intelligence-computer-science.aspx)

Computer Science BSc with a year in industry (/undergraduate/courses/computer-science/computer-science-industry.aspx)

Computer Science with Business Management BSc with a year in industry (/undergraduate/courses/computer-science/computer-science-business-industry.aspx)

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

Details

This four-year accredited programme has a student satisfaction rating of 96%.

Artificial intelligence is the science of giving computers human-like intelligence. It is a multidisciplinary field that draws on ideas from computing, psychology, neuroscience, philosophy, mathematics and linguistics. This degree programme focuses particularly on the contribution of computing to artificial intelligence and, as a result, it aims to give you all the computing skills you need to enter industry, while also allowing you to acquire scientific skills in order to develop leading edge technologies in, for instance natural language-based technologies, computer vision and robotics.

First year

In this year you learn about theories of mind and techniques for generating intelligent behaviour. These include understanding human language and logic, techniques for game playing, expert systems for medical diagnosis, and many others. You experiment with the techniques by implementing them as computer programs. You meet weekly with your tutor, write essays and discuss major AI issues with other students in a small group setting.

In the Computer Science part of your degree you will gain a firm foundation in the principles of algorithms, artificial intelligence, software engineering and relevant mathematics. You also learn computer programming in Java – a language widely used in business and industry. The module on Robot Programming introduces you to some important ideas that underpin intelligent robotics and includes group work as part of our commitment to preparing you for the world of work.

Second year

In the second year you take more advanced modules in specific areas of AI, including an Introduction to Natural Computation, Machine Learning, Computer Vision and Natural Language Understanding. You learn an AI programming language, and take core Computer Science modules in which you will apply your Java skills to building systems involving databases, graphics and human–computer interaction. You will also study the principles underpinning computer architectures and operating systems. These modules will give you all the skills you need to carry out your final-year project.

Third year – Year in Industry

We encourage our students to gain as much real world experience as they can during their studies. The University has strong links with a number of employers offering internships or formal placements that can range from two months over the summer vacation to a full sandwich year as part of your degree course. The college internship officer and industrial liaison tutor supports students to find work placements. We also have a vacancy database with over 2000 graduate job vacancies and internship opportunities targeted towards University of Birmingham students each year. Please visit our website for more information about the **Year in Industry (http://www.cs.bham.ac.uk/admissions/undergraduate/year_in_industry.php)** .

Fourth year

In the final year you have enormous freedom of choice. One third of your time is spent on a project which can be chosen from a wide selection offered by staff members, or developed from your own idea. This usually involves writing a large piece of software and gives you the freedom to extend and demonstrate your skills in a manner of your choosing. In the other two-thirds of your time, you can choose freely from over 20 optional modules, including some specialist AI modules such as Intelligent Robotics, Neural Computation and Advanced Natural Language Processing. You can choose to specialise in Computer Science or AI, or take a mixture of modules from both themes.

Related links

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

Why study this course

Understanding the nature of intelligence is one of the scientific challenges of the 21st century. Artificial Intelligence (AI) is a fascinating subject in which you build intelligent machines and study the nature of the mind. This is especially relevant in today's world because many cutting-edge applications need to benefit from systems that perform tasks which normally require human intelligence. Good examples of this is creating realistic characters in computer games, or in making robots that can adapt to their environment.

From a scientific viewpoint, artificial intelligence is a multidisciplinary field that connects with computing, psychology, neuroscience, philosophy, mathematics and linguistics. As a result, this degree programme will give you all the computing skills you need to enter industry, while also allowing you to acquire scientific skills in order to pursue research.

We are one of the leading centres for AI teaching and research in Europe, which enables us to offer an unusually rich and innovative programme for undergraduate study. You will benefit from a dedicated robotics and vision laboratory with state-of-the-art equipment where you can work on practical exercises and projects.

Examples of AI technologies include:

- Neural networks simulate the work of neurons in the brain
- Natural language processing aims to produce computer systems that can understand both the meaning of language input and the emotions being communicated, for instance in providing customer feedback systems
- Theorem provers allow computers to solve mathematical problems and discover new mathematical concepts

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: AAA

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:

International Baccalaureate Diploma: 6,6,6 at Higher Level, including Mathematics or Computing with a minimum of 32 points overall. We require 5 at Standard Level English and will consider 5 at Standard Level Mathematics, if not offered at Higher Level.

Please note: typical offer grades are for guidance only, other qualifications are considered – learn more about **entry requirements (http://www.birmingham.ac.uk/students/ug/requirements)** .

It is desirable, but not essential, to have some experience of writing computer programs

Please note that Access qualifications are not suitable for this programme

International students:

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

We...will...educate...you. University of Birmingham robot helps to launch British Science Festival (/news/latest/2014/04/launch-of-british-science-festival-7-04-14.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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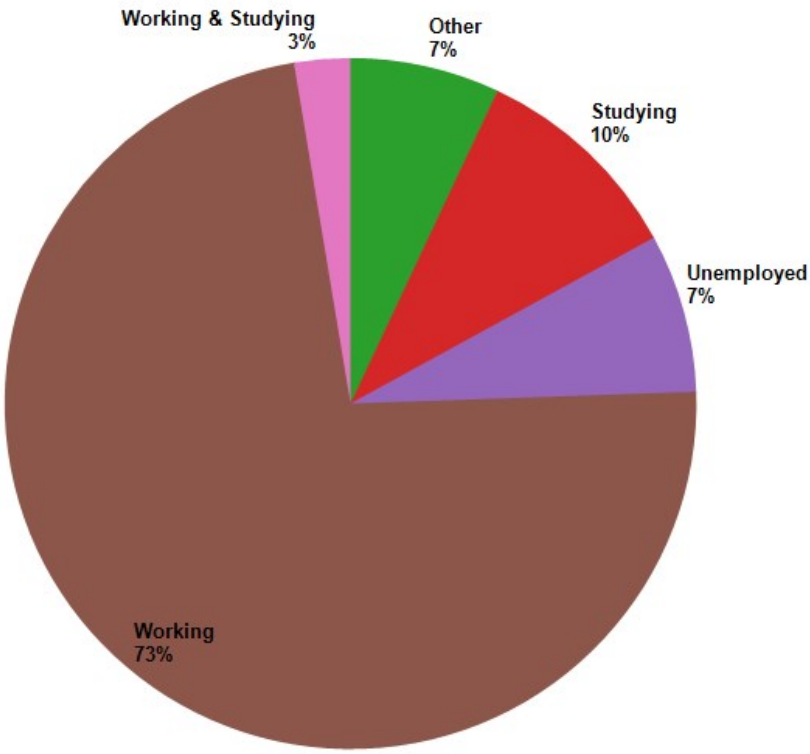
Destinations of Leavers from Higher Education (DLHE) 2011/12

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.

90% Students agreed staff are good at explaining things

To see more details and compare with other courses

Visit

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