



University of
Nottingham

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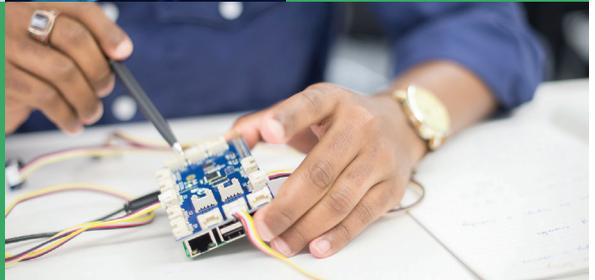
Computer Science



Program it



Connect it

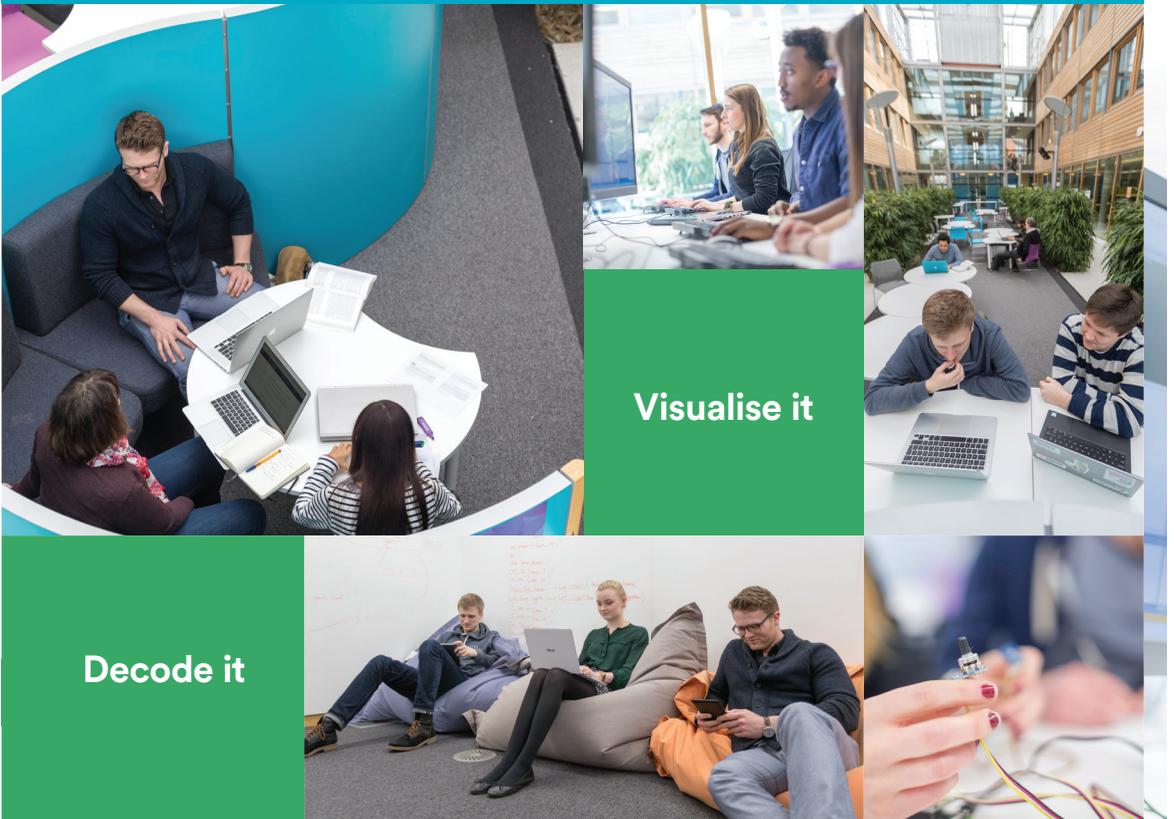


nottingham.ac.uk/computerscience
Undergraduate guide 2018

Contents

Contents

Welcome	3
Why study with us?	4
Our courses	6
Industry placement	11
Study abroad	12
How will I study?	13
How do I apply?	14
Careers and employability	16
Student experience	18



Visualise it

Decode it

Welcome

Welcome to the School of Computer Science

I am delighted that you are considering studying computer science at the University of Nottingham.

Your lectures and seminars will be based around the latest developments, something that's absolutely vital in a fast-moving industry like computer science. You will benefit from up to the minute software and dedicated computer labs.

Our degrees are designed to equip you with an in-depth knowledge of how computers work and how that knowledge can be applied to design and implement the systems of the future.

Coupled with an impressive range of valuable transferable skills such as problem solving, project management and independent research, this means that you will be well positioned to apply for roles within companies such as Adobe, Google, IBM and Microsoft.

The school was awarded Best School/ Department at the University's 2014 and 2015 Staff Oscars, which is a student-led event. This shows that we offer great teaching with personal support, within a fantastic community.

I look forward to welcoming you to Nottingham.

Professor Jon Garibaldi
Head of the School of Computer Science

To find out where a degree in computer science could take you, please visit
nottingham.ac.uk/computerscience

Why study with us?

Studying computer science at Nottingham

Computer science is about representing, transforming, analysing and distributing information. In the modern world this data is everywhere, it comes from many different sources and can be used in a variety of ways.

A computer science degree from the University of Nottingham will leave you well placed to understand how to program today's computers and also how to design and implement the systems of the future, whether they are a traditional computer system, a smartphone or something completely new.

Research excellence

Computer science is a subject that changes at such speed that it is vital you are taught by people who are driving the subject forward. Being taught by staff who carry out research means your knowledge is up to date and relevant, and that you learn from people who are genuinely excited about what they teach. You might find yourself working on world-leading research for your third or fourth-year project, or they may inspire you to carry out your own research at postgraduate level.

At a glance

- 2nd in the UK for research environment*
- Top 10 computer science department in the UK for research power*
- Benefit from exclusive access to computer science facilities



* Research Excellence Framework, 2014.

4

To find out where a degree in computer science could take you, please visit nottingham.ac.uk/computerscience

Professional accreditation

Our BSc Computer Science and BSc Computer Science with Artificial Intelligence degrees are accredited by the British Computer Society (BCS), which is the licensing body for the Engineering and Science Councils. Graduates from these degrees qualify for exemption from the BCS Professional Examination; hence their degree counts as partial fulfilment of the requirements for full professional accreditation of Chartered IT Professional, Chartered Engineer and Chartered Scientist.

Our course curriculum has been designed to be compliant with the Association for Computing Machinery (ACM) and the Institute of Electrical and Electronic Engineers (IEEE). We are one of the first higher education institutions in the country to be in line with these internationally recognised educational recommendations.

Investments in the school

We are based on Jubilee Campus, a beautifully designed campus with striking buildings, innovative green technology and plenty of open spaces.

We provide all the facilities you will need to succeed in computer science.

Along with access to university-wide facilities, computer science students will have exclusive access to the following:

- 24-hour access to dedicated computer labs with regularly updated hardware
- study space for group work in labs and common areas as well as private study areas
- a pool of Linux workstations and remote access to Linux (SuSE/CentOS) servers
- virtual servers for teaching and projects in a high availability cluster
- MSDN® access for registered students
- external remote full desktop access to the computer science teaching environment from personal mobile and desktop devices

Personal tutors

You will be allocated a personal tutor to help and advise you during your time at university. Your tutor is one of your first ports of call in the school if you have any problems or questions and will offer you help, encouragement and feedback on your performance on the course.

Prior programming experience

What we are looking for when you apply for computer science is an enthusiasm for the subject and evidence of why you would do well. Programming experience is not compulsory for entry to any of our courses as our first year is designed to bring all our students to the same level of knowledge and skill.

Our courses

Degree title	UCAS code	Duration	A levels	IB
Single honours				
BSc Computer Science	G400	3 years	AAA-AAB*	34-32***
MSci Computer Science	G404	4 years	AAA-AAB*	34-32***
BSc Computer Science with Year in Industry	G407	4 years	AAA-AAB*	34-32***
MSci Computer Science including International Year	G406	4 years	AAA-AAB*	34-32***
BSc Computer Science with Artificial Intelligence	G4G7	3 years	AAA-AAB*	34-32***
MSci Computer Science with Artificial Intelligence	G4G1	4 years	AAA-AAB*	34-32***
BSc Computer Science with Artificial Intelligence with Year in Industry	G4GB	4 years	AAA-AAB*	34-32***
MSci Computer Science with Artificial Intelligence including International Year	G4GA	4 years	AAA-AAB*	34-32***
BSc Data Science	I260	3 years	AAA**	36****

* Plus 5 GCSE's at grade 5 including maths, AAB if A levels include computing/computer science.

** Including A in maths or A*AB (with A* in maths) or AAB (with A in maths) if this also includes an A level in computer science.

*** Including 5 in Standard or Higher Level mathematics.

**** Including 6 in maths at Higher Level.

In keeping with the reform to GCSEs in England where subjects are to be graded from 9 to 1 instead of A* to G, we can confirm that in accordance with Ofqual recommendations, we will treat GCSEs graded numerically as GCSE grade A=7, B=5, C=4. GCSE qualifications taken outside of the UK will still be graded A* to G.

English language requirements

IELTS 6.5 (no less than 6.0 in any element).

For more information and a list of the alternative English language requirements we accept, please see nottingham.ac.uk/go/alternativerequirements

Developing your academic English and study skills

The Centre for English Language Education (CELE) offers you the opportunity to develop your English language skills at one of the world's top universities. Accredited by the British Council for the teaching of English, CELE provides high-quality teaching, facilities and support. Our pre-sessional courses take your English language and academic skills to the level you need to progress to undergraduate study without taking IELTS again. Find out more at nottingham.ac.uk/cele

BSc | MSci Computer Science

Our Computer Science courses provide you with a rigorous treatment of all core topics in computer science – both theoretical and practical, a wide range of technical and analytical skills. It also provides hands on experience with the numerous and fascinating applications of computer science including web and mobile applications, games, social networks, and artificial intelligence.

Year one

In year one you will learn the key concepts and tools underpinning modern computer science. You will learn how to program in C, Java and Haskell, and study the architecture and applications of computer systems.

Year two

In year two you will take part in a software engineering group project. At the same time you will study programming and the underlying theory of computation in greater depth and meet new topics, such as networks and the design of large scale systems.

Year three

In year three you will undertake modules in Computer Security and Professional Ethics in Computing. There will be a wide range of specialised optional modules you can select, including an individual research project.

Year four (MSci students)

If you opt for the four-year MSci course, you will engage with cutting-edge research and professional software development allowing you to participate in the developments in the field. The year four research-led modules are continuously revised and updated.



The teaching style in first year allows for everyone, regardless of prior experience, to reach the same level by the second year, where it is more focused towards specialisation. Overall, my first year was an interesting and amazing experience as it was the first time I had ever been exposed to programming at university level.

Stephen Sowole, BSc Computer Science

For more detailed course content visit
nottingham.ac.uk/ugstudy/computerscience

BSc | MSci Computer Science with Artificial Intelligence

Artificial intelligence has truly started having a defining effect on society, underpinning a number of technologies such as social networks, games and self-driving cars.

This course takes the standard computer science degree and focuses on subjects which explore these cutting-edge ideas. You will learn about robotics, machine learning, computer vision, neural networks, and the history and future of this exciting subject.

Year one

You will be introduced to the key concepts and tools underpinning modern computer science with artificial intelligence. You will learn how to program in Java, study the architecture and applications of computer systems and will be introduced to the areas of artificial intelligence that you will focus on in later years.

Year two

In year two, you will take part in the Software Engineering Group Project, as well as being introduced to more programming languages, and Artificial Intelligence Methods.

Year three

In third year you will undertake core modules in computer security and professional ethics in computing. You will also be exposed to specialised optional modules to choose from including an individual research project.

Year four (MSci students)

The four-year MSci is more advanced and designed to produce high-quality graduates who show independent thought, flexibility and maturity, and who command a sound technical knowledge of the broad aspects of computer science and artificial intelligence. You will also be exposed to research-level topics, particularly in artificial intelligence, that will allow you to appreciate, and participate in, future developments in the field. The year four research-led modules are continuously revised and updated.

“Computer science with artificial intelligence has granted me the opportunity to develop applications and systems that not only have real world applications, but that rival the existing technologies in the field. The ability to specify what I want to build, and how I want to build it has allowed me a vast range of creative freedom within the work that I do.”

Richard Davies, Computer Science with Artificial Intelligence



Typical modules			
Year one	Year two	Year three	Year four (MSci only)
<p>Core</p> <ul style="list-style-type: none"> ■ Programming and Algorithms ■ Computer Fundamentals ■ Systems and Architecture ■ Mathematics for Computer Scientists ■ Databases and Interfaces ■ Software Engineering ■ Programming Paradigms ■ Fundamentals of Artificial Intelligence 	<p>Core</p> <ul style="list-style-type: none"> ■ Software Engineering Group Project ■ Algorithm Correctness and Efficiency ■ Operating Systems and Concurrency ■ Languages and Computation ■ Software Maintenance <p>Optional</p> <ul style="list-style-type: none"> ■ Introduction to Image Processing ■ Advanced Functional Programming ■ C++ Programming ■ Introduction to Human Computer Interaction ■ Software Specification ■ Artificial Intelligence Methods ■ Distributed Systems 	<p>Core</p> <ul style="list-style-type: none"> ■ Professional Ethics in Computing ■ Software Specification <p>Optional</p> <ul style="list-style-type: none"> ■ Automated Decision Support Methodologies ■ Autonomous Robotic Systems ■ Collaboration and Communication Technologies ■ Computability ■ Computer Graphics ■ Knowledge Representation and Reasoning ■ Machine Learning ■ Software Quality Metrics ■ Individual Dissertation ■ Designing Intelligent Agents ■ Computer Vision ■ Compilers ■ Mobile Device Programming ■ Fundamentals of Information Visualisation 	<p>Modules include:</p> <ul style="list-style-type: none"> ■ Advanced Computer Networks ■ Advanced Algorithms and Data Structure ■ Design Ethnography ■ Mathematical Foundations of Programming ■ Simulation and Optimisation for Decision Support ■ Autonomous Robotic Systems ■ Mixed Reality Technologies ■ Data Modelling and Analysis ■ Foundations of Programming Mini-Project ■ Games ■ Software Engineering Management ■ Linear and Discrete Optimisation

Modules may change, for example due to curriculum developments. The above list is a sample of typical modules that we offer, not a definitive list. The most up to date information can be found on our website at nottingham.ac.uk/ugstudy

BSc Data Science

Data science is a rapidly growing discipline which is already redefining the world around us. This BSc provides you with a comprehensive mathematical background and the computer science skills needed to be at the forefront of this new discipline.

Year one

The first year covers the foundations of the course incorporating both computer science and mathematics.

Year two

The second year expands on these foundations and focuses on methods for gaining insights from data. We offer opportunities for specialisation through optional modules, including topics in human computer interaction.

Year three

The final year allows you to specialise through a larger set of optional modules. Your final year project provides an opportunity to bring these skills together to address real data analysis problems in a rich and supportive environment.

Typical modules

Year one	Year two	Year three
<p>Core</p> <ul style="list-style-type: none"> ■ Computer Fundamentals ■ Databases and Interfaces ■ Fundamentals of Artificial Intelligence ■ Programming and Algorithms ■ Calculus and Linear Algebra ■ Probability ■ Statistics ■ Analytical and Computational Foundations 	<p>Core</p> <ul style="list-style-type: none"> ■ Algorithms, Correctness and Efficiency ■ Introduction to Scientific Computation ■ Probability Models and Methods ■ Statistical Models and Methods <p>Optional</p> <ul style="list-style-type: none"> ■ Introduction to Human Computer Interaction ■ Languages and Computation ■ Software Maintenance ■ Operating Systems and Concurrency ■ Artificial Intelligence Methods ■ Advanced Functional Programming ■ Introduction to Image Processing ■ C++ Programming ■ Software Specification ■ Distributed Systems 	<p>Core</p> <ul style="list-style-type: none"> ■ Machine Learning ■ Optimisation <p>Optional</p> <ul style="list-style-type: none"> ■ Designing Intelligent Agents ■ Knowledge Representation and Reasoning ■ Stochastic Models ■ Game Theory ■ Coding and Cryptography ■ Mathematical Finance ■ Multivariate Analysis ■ Computer Security ■ Software Quality Metrics ■ Computer Vision

Modules may change, for example due to curriculum developments. The above list is a sample of typical modules that we offer, not a definitive list. The most up to date information can be found on our website at nottingham.ac.uk/ugstudy

Industry placement

You can follow either the computer science or computer science and artificial intelligence syllabus throughout year one and two and then embark on a year in industry.

With a fully structured programme of events and help from the Careers and Employability Service throughout the first two years, you will have the very best chance of finding a placement and continued support while you're out on placement. On your return, you will resume your studies in year three.

The year in industry programme was designed to make sure that employers partaking are vetted and able to fully support students' development and provide a constructive learning environment for their intern. We visit students on placement and meet their managers too. It's truly a testament to our students when we hear of the mutualistic benefits that placement students bring: the fresh ideas, enthusiasm and the astounding level of computational knowledge gathered by the end of second year.

Support on the year in industry

Dedicated members of the Careers and Employability Service deliver a timetable of tailored workshops and seminars for year in industry students, such as CV writing, interview and assessment centre tips and professionalism. Drop in sessions are also available through the Careers and Employability Service.

Specific recruitment fairs are held for Year In Industry students with placement providers invited from a range of companies. The University's MyCareer database lists upcoming placement opportunities and the school's academic advisor has many industry contacts.

The school monitors students' progress while out on placement with visits from academic staff and through frequent submissions of a reflective log and progress reports at the end of each semester. We offer an open-door policy so that students never need to feel distant from us.



For more information about studying computer science visit nottingham.ac.uk/computerscience

Study abroad

Our computer science and computer science with artificial intelligence programmes are available as a four year MSci with an international year. You will spend the third year of your course studying an approved computer science programme at one of our partner universities. These currently include Australia, Canada, Hong Kong, Ireland, Mexico or New Zealand.

Studying abroad offers a broad spectrum of benefits alongside total immersion into new cultures. Experiencing learning methods at other world leading universities is not only an amazing event in your life but also something that will make your CV shine under employers' spotlights.

You will study a framework of core modules at the host school which builds on the foundation of years one and two and prepares you for the final year in Nottingham. Optional modules will allow you to benefit from the unique opportunities for study at the host school. Currently, reduced tuition fees are payable during this year.



Engaging study, incredible results

You will learn through a wide variety of activities including formal lectures, small-group tutorials, practical computer labs and, increasingly important at university, self-directed study.

Teaching

Lecture-based modules will form the backbone of your studies in the first year, when you will be taking up to six modules at any given time. Each module will typically involve around three hours of study per week, combining a mix of formal lectures and associated supporting activities such as tutorials or computer labs, adding up to a total of about 20 hours of timetabled activity.

Practical teaching

Practical, self-directed study will play a central role in your learning throughout your degree, particularly in relation to the group and individual projects which take place from second year.

The computer science building is ideal for this purpose, offering areas such as the hub, atrium and meeting pods in which students can meet and discuss their work.

Practical programming learning takes place in one of our recently refurbished labs.

Study support

As well as receiving support from your personal tutor we also run a Guru Scheme where first years can get advice and support from students who excelled in their first year. Throughout the year, you will be able to seek academic advice from the course director for your degree, tutors, gurus, and module convenors.

How will I be assessed?

Lecture-based modules will typically be assessed at the end of the semester in which they are taught. A substantial number of computer science modules have an element of practical coursework components as full or part assessment.

Experience credits

Experience credits are a new innovative way for our students to earn credits towards their degree. This optional module has been designed so we can offer students recognition of independent development.

Credits can be gained from; code written during an internship, contribution to an open source project, releasing an app, or involvement in teaching and outreach projects.

For more information about studying computer science visit nottingham.ac.uk/ugstudy/computerscience

How do I apply?

How to apply

All applications for an undergraduate place to study at the University of Nottingham, including applications by international students, must be made through UCAS.

Applications should be made online at ucas.com and candidates will be notified of decisions through UCAS Track.

Your personal statement

This is the section of your UCAS form that tells us most about you, and you should make the best use of it. Be as specific and detailed as you can – we would like to see that you are a student who can work hard, be self-motivated and make the best possible use of the opportunities that our courses offer you. We would also like to hear about any skills you have gained through extracurricular activities.

Over one-third of our UK students receive our means-tested core bursary, worth up to £2,000 a year. For details, see nottingham.ac.uk/financialsupport



Alternative qualifications

In this brochure you will find our A level entry requirements but we accept a much broader range of qualifications.

These include:

- Access to HE Diploma
- Advanced Diploma
- BTEC HND/HNC
- BTEC Extended Diploma
- Cambridge Pre-U
- International Baccalaureate
- Irish Leaving Certificate
- Scottish Advanced Highers
- Welsh Baccalaureate Advanced Diploma

Flexible admissions policy

We recognise that some educational and personal circumstances affect achievement. If we judge that you have experienced circumstances that have adversely affected your achievement, we will consider them when assessing your academic potential. Some courses may vary the offer as a result. For the most up to date information about our offers, please see the entry requirements section of our course pages on our online prospectus. For more information about this policy, please see nottingham.ac.uk/ugstudy/applying

Mature applicants

We encourage applications from mature applicants who have a significant gap in education. You should apply in the normal way through UCAS. More information for mature students can be found at nottingham.ac.uk/mature

To find out how to apply please visit nottingham.ac.uk/ugstudy/applying

International applicants

The University provides a range of information and advice for international applicants. If you are unable to attend an open day, we can meet you in your country at one of our overseas events or arrange an individual visit to the University. For further information please visit nottingham.ac.uk/go/international-applicants

Deferred entry

Applicants who wish to defer their entry by a year will not be at a disadvantage. Please tell us something about your plans for your gap year in your UCAS personal statement.

Equal opportunities policy

The University aims to create the conditions whereby students and staff are treated solely on the basis of their merits, abilities and potential, regardless of gender, race, colour, nationality, ethnic or national origin, age, socio-economic background, disability, religious or political beliefs, trade union membership, family circumstances, sexual orientation or other irrelevant distinction.

World class for employability

Careers and Employability Service

Our Careers and Employability Service has a team dedicated to Faculty of Science students. They will be on hand to offer you specialist support and guidance throughout your degree and for life after you graduate. Whether you need help writing a CV, preparing for an interview or exploring career ideas, you can book one-to-one appointments or come along to a workshop. Each term there is also an exciting events schedule, bringing you face-to-face with employers offering real-life insight into their professions.

94% 
of first-degree graduates

in the school who were available for employment had secured work or further study within six months of graduation.*

£26,574 

was the average starting salary with the highest being £42,000.*



The Nottingham Advantage Award

The award-winning Nottingham Advantage Award recognises and rewards your extracurricular activities. With a choice of over 200 modules, you can hone the key skills employers want. From developing your leadership skills and learning a language to public speaking and volunteering, you will leave university with demonstrable experience that sets you apart from other graduates.

Recent graduate destinations:

- software and hardware development
- financial sector
- business sector
- set up your own business
- teaching
- industrial research
- academic research

We have staff members with experience of all these options who can advise you further.



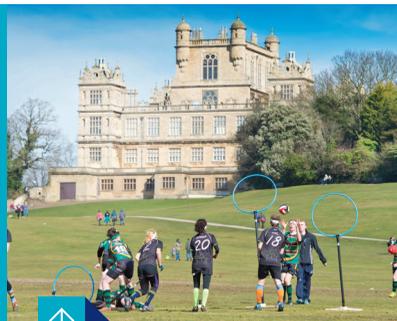
Find out where Nottingham could take you and network with our graduates on LinkedIn.

* Known destinations of full-time home first-degree undergraduates 2014/15. Salaries are calculated based on those in full-time paid employment within the UK.



Experience it in a world beyond ordinary

There's so much for you to get involved in and explore at the University and around the city. Whether you're interested in sports, learning a language or just having fun with friends alongside studying, you'll be spoilt for choice.



Your opportunity to study abroad

We offer a range of study abroad opportunities with many students having the option to live and study in another country as part of their university career. Studying or working abroad is a fantastic opportunity to broaden your horizons, experience different cultures, and develop the key skills that employers are looking for. Find out more: nottingham.ac.uk/studywithus/studyabroad



Getting involved in your Students' Union

University of Nottingham Students' Union (UoNSU) is a brilliant, diverse community, and whether you are an undergraduate or postgraduate, first-year or final-year student, you are a part of it. With 300+ student-led groups, clubs and societies, hundreds of volunteering opportunities and support for every stage of your university journey, your Students' Union offers something for everyone. Find out more: su.nottingham.ac.uk

Exploring your new city

Nottingham city centre is around a 10-minute bus ride away from University Park Campus, so you're always close to the action. There are plenty of music venues, from the world-famous Rock City to the Motorpoint Arena or one of the smaller gig venues for a more intimate live show. If you enjoy shopping, there are independent boutiques and vintage shops as well as high street names in our large shopping centres. Nottingham is also a hotspot for dining, with a great choice of cuisines on offer. Find out more: nottingham.ac.uk/nottinghamlife



Your new home from home

At Nottingham we offer a wide range of room types across the campuses in both catered and self-catered accommodation. From standard single rooms with shared bathrooms to large en-suite studios and flats, there's something to suit every budget and personal choice. For current pricing and to review all accommodation options please visit nottingham.ac.uk/accommodation



Music

All student musicians at the University of Nottingham are encouraged to get involved with the vibrant musical life on campus. Find out more: nottingham.ac.uk/music/performance



Sport

The University of Nottingham is one of the UK's leading universities for sport and is currently ranked 4th in the university sport rankings*. We have one of the biggest portfolios of sports facilities in the country including the brand new £40m David Ross Sports Village. We also have a rich heritage of supporting Olympic medallists and we have more than 70 student sports clubs to choose from. Find out more: nottingham.ac.uk/sport

* British Universities and Colleges Sport Standings, 2015-16.



Your support network

Throughout your university journey there will be numerous people on hand to support and advise you, including tutors and dedicated staff. We have Student Service Centres on all three of our UK campuses, which provide a range of support, information and specialist services. Find out more: nottingham.ac.uk/student-services

Learn a language

The University's Language Centre gives you the opportunity to study a language alongside your course. All languages are offered from beginners' level with some going up to near native competency. There are nine languages to choose from: Modern Standard Arabic, Dutch, French, German, Italian, Japanese, Mandarin Chinese, Russian, and Spanish. Find out more: nottingham.ac.uk/language-centre





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Student Recruitment Enquiries Centre



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UoNComputerScience



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MIX
Paper from
responsible sources
FSC*

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This brochure has been drafted in advance of the academic year to which it applies. Every effort has been made to ensure that the information contained in this brochure is accurate at the time of publishing, but changes (for example to course content) are likely to occur given the interval between publication and commencement of the course. It is therefore very important to check our website for any updates before you apply for the course by following nottingham.ac.uk/ugstudy. Where there is a difference between the contents of this brochure and our website, the contents of the website take precedence.