WARWICK
THE UNIVERSITY OF WARWICK

Department of Computer Science

Undergraduate Studies

"We are proud of our heritage in educating generations of computer scientists who have gone on to advance a science which now permeates every aspect of our society."

Welcome to the Department of Computer Science

I am delighted that you are interested in joining one of our courses in the Department of Computer Science at the University of Warwick. Founded in 1967, we are one of the oldest and most established Computer Science departments in the UK. We are a leading department for computing research, currently ranked second in the UK, and our academic staff members are leaders in their fields. We are proud of our heritage in educating generations of computer scientists, who have gone on to advance a science that now permeates every aspect of our society.

As a leading department in a world-class university, we are committed to teaching excellence. The Department is housed in a dedicated state-of-the-art facility, at the heart of a newly completed £100m Mathematical Sciences and Engineering quadrangle. Academics and students work alongside each other in a relaxed and friendly environment, in which support is always at hand. Our staff deliver innovative, cutting-edge teaching, drawing on their research expertise. Increasingly courses are taught with industrial partners, cementing our already close links with employers, and preparing students for their future careers.

This is an exciting time for us: the University was declared the 2015 University of the Year by the Times and the Sunday Times; Warwick has just celebrated its 50th anniversary year and has broken into the top 10 of the world's young universities, as judged by the THE World University Rankings; and Warwick Computer Science is to play a leading role in the establishment of the Alan Turing Institute, a world-leading centre for Data Science based in London.

Warwick offers a friendly, caring and stimulating environment in which to study. You will be encouraged to excel, and to build a strong foundation for a bright future ahead.

Professor Stephen Jarvis
Head of Department

The University of Warwick

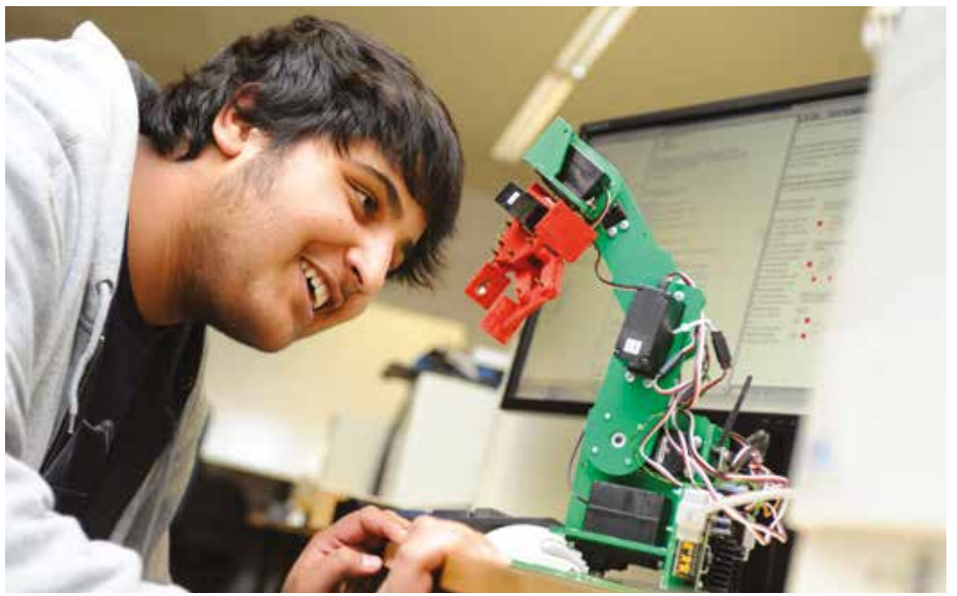
Our teaching is driven by the pursuit of academic excellence and our desire to see each of our students succeed.

We pride ourselves on providing students with the knowledge, skills and confidence to make the best possible start to their careers and have an impact in the wider world. This is precisely why our students are sought after by premier graduate employers, including those in technology, engineering, financial services and government.

Located on a picturesque campus, the University is home to more than 23,000 students and 5,000 staff from around the world. This concentration of diversity creates a lively, cosmopolitan atmosphere that is unrivalled across the UK. Our campus is located in the heart of rural Warwickshire, ideally placed to explore the country, with excellent transport links to Birmingham, Oxford and London.

Warwick is a world-leading university that is consistently ranked in the top 10 of all UK university league tables.

The Department of Computer Science



Established in 1967, we are ranked second in the UK for Computer Science research. Our degree programmes are internationally renowned for their blend of rigour and industrial relevance.

We are noted for our friendly academic community and excellent student support. Maintaining a low student-staff ratio allows us to ensure that every student receives excellent tuition and the opportunity to develop according to their interests.

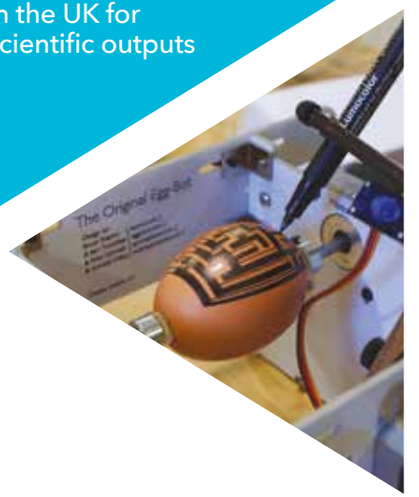
All students have 24-hour access to dedicated computing laboratories, each of which is equipped with high specification workstations and comfortable spaces for group work and collaboration. This is in addition to specialised hardware and software for student projects. We have specialist state-of-the-art equipment to support teaching in areas including computer graphics and high-performance computing. Our student-led iLab provides opportunities for students to explore and experiment with the latest mobile, pervasive and immersive technologies.

We play a leading role in five interdisciplinary research centres and are one of the founding partners of the prestigious Alan Turing Institute for Data Science. This institute – a £42 million collaboration between UK leaders in Computer Science and Mathematics – will shape policy in the UK and stimulate research activity in data science for decades to come, creating unique opportunities for all of our students.

All our single honours courses are accredited by the British Computer Society, fully meeting the educational requirement for CTIP registration and, in the case of the MEng degree, for CEng / CSci registration. Courses have also been awarded European Quality Labels by EQANIE.

We have excellent relationships with leading international organisations and many of our students spend a year in industry, undertake summer internships or take the opportunity to study abroad.

1st
in the UK for scientific outputs



2nd
in the UK for computing research

97%
of research rated world leading or internationally excellent

2nd
in the UK for research impact

"It makes a huge difference to be taught by leading scientists. Every aspect of learning, from lectures to tutorials, benefits from the research they do and the partnerships they create. It's incredible to think that these are the people who will be helping me develop my own projects."

Emma Chambers
Computer Science (Second Year)

"Everyone in the Department is very friendly and always willing to help. That sense of community and support definitely motivates you to do well."

Ishe Gambe
Computer Science (Second Year)

Teaching and Learning in Computer Science

Our degree courses attract highly qualified students and provide them with a theoretical foundation in established areas of their discipline, as well as the opportunity to apply what they learn to industrially relevant problems throughout their degree. This combination enables students to pursue careers in a diversity of sectors, regardless of which of our courses they decide to study.

We offer five degree courses, each of which allows students to align their learning with their interests and aspirations.

- Computer Science (BSc/MEng)
- Computer Systems Engineering (BEng/MEng)
- Discrete Mathematics (BSc/MEng)
- Data Science (BSc)
- Computer and Management Sciences (BSc)

Degree courses are offered as 3-year Bachelor of Science (BSc) and, in most cases, a 4-year Master of Engineering (MEng) variant. Students are offered the flexibility to transfer between BSc and MEng courses until the end of their second year. Transfer between courses at the start and end of the first year is possible, subject to academic performance.

The MEng courses that we offer provide greater depth and breadth of coverage than their BSc counterparts. This is made possible through an additional year of study in advanced topics and, in the case of Computer Science and Computer Systems Engineering, a significant group project. The completion of these results in graduates who have a deep understanding of their discipline and are extremely attractive to employers.

Each degree course comprises a set of modules. Some modules are compulsory, however students also select from a range of optional modules in each year of study. Optional modules can be directly associated with the degree subject or may be chosen from related or unrelated disciplines, providing considerable flexibility for students to tailor their studies. Optional modules taught by the Warwick Business School and the departments of Philosophy, Economics and Modern Languages are popular choices. Students are permitted to sample modules before committing to them being counted for degree credit.

We are committed to high-quality teaching underpinned by rigorous mathematical understanding and cutting edge research.

Professor Graham Martin
Deputy Head of Department
(Teaching and Learning)

BSc Computer Science
MEng Computer Science

Computer Science is a rigorous discipline whose fundamentals are drawn from mathematics and physical sciences. We assume no prior knowledge of computing or programming but will harness your talent and passion for technology, and your desire to understand and apply computing principles.

You will acquire technical skills in software engineering, algorithm analysis and system design, as well as experience of project management, research and scientific methods. You will work closely with industry leaders, enabling you to develop industrially relevant subject knowledge and transferable skills, such as communication, teamwork and planning, which are highly valued by employers. An example of this can be found in the second-year Group Software Engineering Project, taught in conjunction with Deutsche Bank, which allows you to apply the knowledge gained in your first year to real-world problems.

Your first year lays the foundation for a deeper knowledge of Computer Science through the study of advanced mathematics, computer architecture and programming. Your second year will then build on this knowledge to explore areas such as operating systems and computer networks, database systems and software engineering.

In your third year you will undertake an individual project, where you will apply your knowledge to an area of your choice under the supervision of world-leading academics. Throughout the course you can select from a range of optional modules, including those in areas such as artificial intelligence, computer graphics and computer security.

If you follow the MEng course you will stay on for a fourth year to study more advanced material. You will also participate in an group project, which will integrate taught material as well as helping you to improve your research and development skills in a team environment.

Regardless of whether you are admitted onto the BSc or MEng course, you have the option to transfer between the two variants until the end of your second year. You will need to achieve a 2:1 or higher in your second year to proceed onto the MEng course.

The option of spending a year in industry or studying abroad is available to all students.

UCAS Code: G400 (BSc), G403 (MEng)

TYPICAL OFFER

A-level: A*AA (MEng) / AAA (BSc)
including an A in Mathematics

IB: 38 (BSc) / 39 (MEng)
including 6 in Higher Level Mathematics

BEng Computer Systems Engineering
MEng Computer Systems Engineering

Computer Systems Engineering is a fully integrated degree taught jointly by the Department of Computer Science and the School of Engineering. The focus of the course is on the design of computer systems and their real-time applications, with an emphasis on pervasive technologies, including wireless networks, mobile devices and sensors, robotics and wearable technology.

The computer systems engineer has the fundamental knowledge and skills of an electronics engineer, but with an emphasis on digital electronics, low-power systems, communications, control and real-time operation. The computer systems engineer is also able to apply state-of-the-art computer science methods for the validation and verification of algorithms, fault-tolerant design, code optimisation, and to use high-performance computing techniques to design efficient and robust embedded systems.

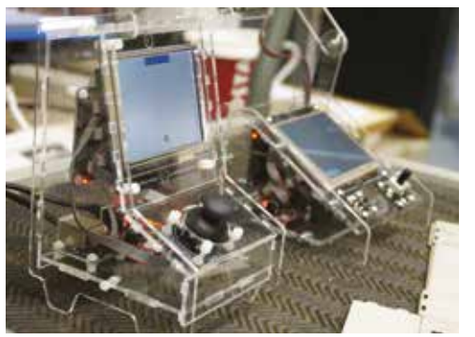
Like our Computer Science degree course, you will receive a firm grounding in the principles of Computer Science, which will be broadened and complemented by the experience of engineering electronic systems. In your first year you will study computer programming, data structures and algorithms as well as system modelling, and electronic devices and circuits. The second year builds on both core disciplines through the study of modules in areas such as digital systems design, advanced computer architectures, software engineering, signal processing and computer networks.

In your third year you will undertake an individual project, where you will apply your knowledge to an area of your choice under the supervision of world-leading academics from Computer Science and Engineering. You will also study embedded systems, sensor networks and mobile communications, robotics, and modern VLSI design.

If you follow the MEng course you will stay on for a fourth year to study more advanced material. You will also participate in an interdisciplinary group project, which will integrate taught material as well as helping you to improve your research and development skills in a team environment.

Regardless of whether you are admitted onto the BEng or MEng course, you have the option to transfer between the two variants until the end of your second year. You will need to achieve a 2:1 or higher in your second year in order to proceed on the MEng course. If you are studying the 3-year variant of this course you may choose to have your degree awarded as a BEng or a BSc.

The option of spending a year in industry or studying abroad is available to all students.



UCAS Code: G406 (BEng), G408 (MEng)

TYPICAL OFFER

A-level: A*AA (MEng) / AAA (BEng)
including an A in Mathematics

IB: 38 (BSc) / 39 (MEng)
including 6 in Higher Level Mathematics

BSc Discrete Mathematics
MEng Discrete Mathematics

Our Discrete Mathematics degree is unique in the UK, focusing on the study of the mathematical structures commonly employed in the foundations of computing and modern applications. The course is taught jointly by the Department of Computer Science and the Warwick Mathematics Institute, making it the ideal choice for talented mathematicians with an interest in technology.

Warwick is home to the Centre for Discrete Mathematics and its Applications (DIMAP), a multidisciplinary research centre for discrete modelling, algorithmic analysis and combinatorial optimisation. This means that you will be working alongside internationally renowned academics at the centre of the latest research breakthroughs. You will acquire skills in mathematics and computer science, including those in software engineering, combinatorial analysis, formal proof and algorithmic analysis. These skills will enable you to both analyse and solve problems in an abstract sense, and realise solutions through computer software. These abilities, alongside transferable skills in communication, planning and self-organisation, make our graduates highly employable.

Your first year will establish the foundations of Discrete Mathematics and its applications, covering proofs, formal arguments, and calculations, as well as mathematical reasoning, combinatorial analysis and discrete structures. In your second year you will develop a rigorous understanding of the subject's theoretical basis, which will prepare

you for later specialisation; this will include topics in algorithms, formal languages and graph theory.

In your third and fourth years you will work alongside academics on individual projects as well as focusing on application areas including cryptography, operations research, graph and information theory, combinatorics and safety-critical systems.

Regardless of whether you are admitted onto the BSc or MEng course, you have the option to transfer between the two variants until the end of your second year. You will need to achieve a high 2:1 (65% or more) in your second year to proceed on the MEng course. The BSc and MEng courses have common entry requirements, which means all applications should be made using the BSc course code.

The option of spending a year in industry or studying abroad is available to all students.

UCAS Code: G190 (BSc), G4G3 (MEng)

TYPICAL OFFER

A-level: A*AA
including an A* in Mathematics or Further Mathematics

IB: 39
including 6 in three Higher Level subjects including Mathematics

BSc Data Science

Our Data Science degree, the first undergraduate degree of its kind in the UK, is taught jointly by the Departments of Computer Science and Statistics. This flexible course enables talented mathematicians to pursue the sophisticated theory of modern application domains requiring large-scale data analysis. Data Science is concerned with how to gain knowledge from the vast volumes of data generated daily in modern life, from social networks to scientific research and finance, and proposes sophisticated computing techniques for processing this deluge of information.

Warwick is leading the way in the provision of UK undergraduate degrees in this emerging discipline. Our modules are taught by specialists from the Departments of Statistics, Computer Science and Mathematics, each of which is at the forefront of research. The course provides an essential mix of highly developed mathematical, statistical and computing skills for those with a passion for solving real-world problems. Alongside this core knowledge, you will develop expertise in specialist areas of machine learning, data mining and algorithmic complexity. You will also acquire skills in analytical thinking, cross-disciplinary communication, mathematical and statistical modelling, thoroughly preparing you for careers in the fields of manufacturing, pharmaceuticals, finance, telecoms, scientific research, academia, consultancy and management.

Your first year provides background knowledge and fundamental skills in Data Science, which are further developed in your second year. From this point you will also acquire more specialist expertise, gaining practical experience of industrial software engineering through group project work.

Your final year is focused on applying all these skills, culminating in an individual project on a topic of your choice, involving extended analysis of a substantial data set.

The option of spending a year in industry or studying abroad is available to all students.

"Our involvement in the Alan Turing Institute will provide unique opportunities for our students, allowing them to lead the way in data science for years to come."

Professor Graham Cormode

Alan Mathison Turing
Artist: Elliott & Fry
© National Portrait Gallery, London

UCAS Code: 7G73 (BSc)

TYPICAL OFFER

A-level: A*AA
including an A* in Mathematics or Further Mathematics

IB: 38
including 7 in Higher Level Mathematics

BSc Computer and Management Sciences

Our Computer and Management Sciences course is run jointly with the Warwick Business School, one of the leading business schools in Europe. You will spend two years studying Computer Science, followed by a year studying topics in Management. We assume no prior knowledge of Computer Science or programming.

The course emphasises the role of technology in the modern business environment, enabling our graduates to appreciate and utilise technology in meeting real-world business goals. You will acquire technical skills in software engineering and system design, as well as an understanding of how these impact organisations. Software engineering projects conducted throughout your degree are taught in conjunction with industry professionals and give you the opportunity to test your skills against real-world problems. Alongside a range of technical skills, you will develop a range of industrially relevant skills, including those in communication, planning and management.

Your first year will give you the background and skills to develop a deeper understanding of Computer Science. You will build on this foundation in your second year to further your understanding of areas such as operating systems, computer networks, database systems, digital business technologies, problem solving and software engineering.

In your third year you will take modules in the Warwick Business School, where world-leading academics and industry professionals will teach you about business and management practices. Here you can select from an extensive range of management and business modules, encompassing areas such as marketing, finance, information systems and corporate strategy.

UCAS Code: GN42 (BSc)

TYPICAL OFFER

A-level: AAA
including an A in Mathematics

IB: 38
including 6 in Higher Level Mathematics

"Warwick has already given me some fantastic experiences. I've learnt a lot in just a year and I feel extremely well prepared for a career in technology."

Will Thompson
Computer Science (First Year)

"The flexibility to spend time in industry or abroad as part of my degree was a big factor in my decision to study at Warwick."

Jo Laikin
Computer Science (First Year)

Intercalated Years, Internships and Study Abroad

We offer a variety of possibilities for you to enhance your degree with industrial experience or studies overseas. Each of our degree courses has a so-called intercalated year option, which allows you to spend a year working in industry. The year in industry is typically taken as the penultimate year of your degree.

We provide support for students wanting to spend a year in industry by promoting opportunities, hosting departmental careers fairs and offering one-to-one sessions with our departmental careers advisor. Intercalated year students are supported by their personal tutor and our Industrial Liaison Team during their year in industry. Students working in the UK are visited by academic representatives to review their development during the year.

Students who take an intercalated year return with a deeper appreciation of the application of their discipline and often develop final-year project ideas based on their experiences. Additionally, it is common for students to obtain an offer of a graduate role in their host company on completion of their degree. Our students have spent successful internships at companies including Accenture, ARM, Bank of America, British Telecom, Cisco, Google, GSK, IBM, Intel, Microsoft, Reuters and Unilever.

Regardless of whether you decide to take an intercalated year, there are ample opportunities to gain real-world experience through internships. These programmes usually take place during the summer vacation, allowing you to apply your knowledge and skills in an industrial setting.

An alternative to a year spent in industry is a year spent at a partner institution overseas. We have an established exchange programme with the Hong Kong University of Science and Technology, which provides opportunities for our students to experience teaching and learning at another world leading institution. In addition to benefitting from a rich cultural experience, students returning from studying overseas exhibit an international profile that is attractive to potential employers.

Employability

"The University of Warwick has consistently delivered Computer Scientists of the highest calibre, producing graduates with the vital knowledge and skills to become successful software engineers at world-class software companies."

Sheldon Lachambre
Director of Product Engineering, Citrix

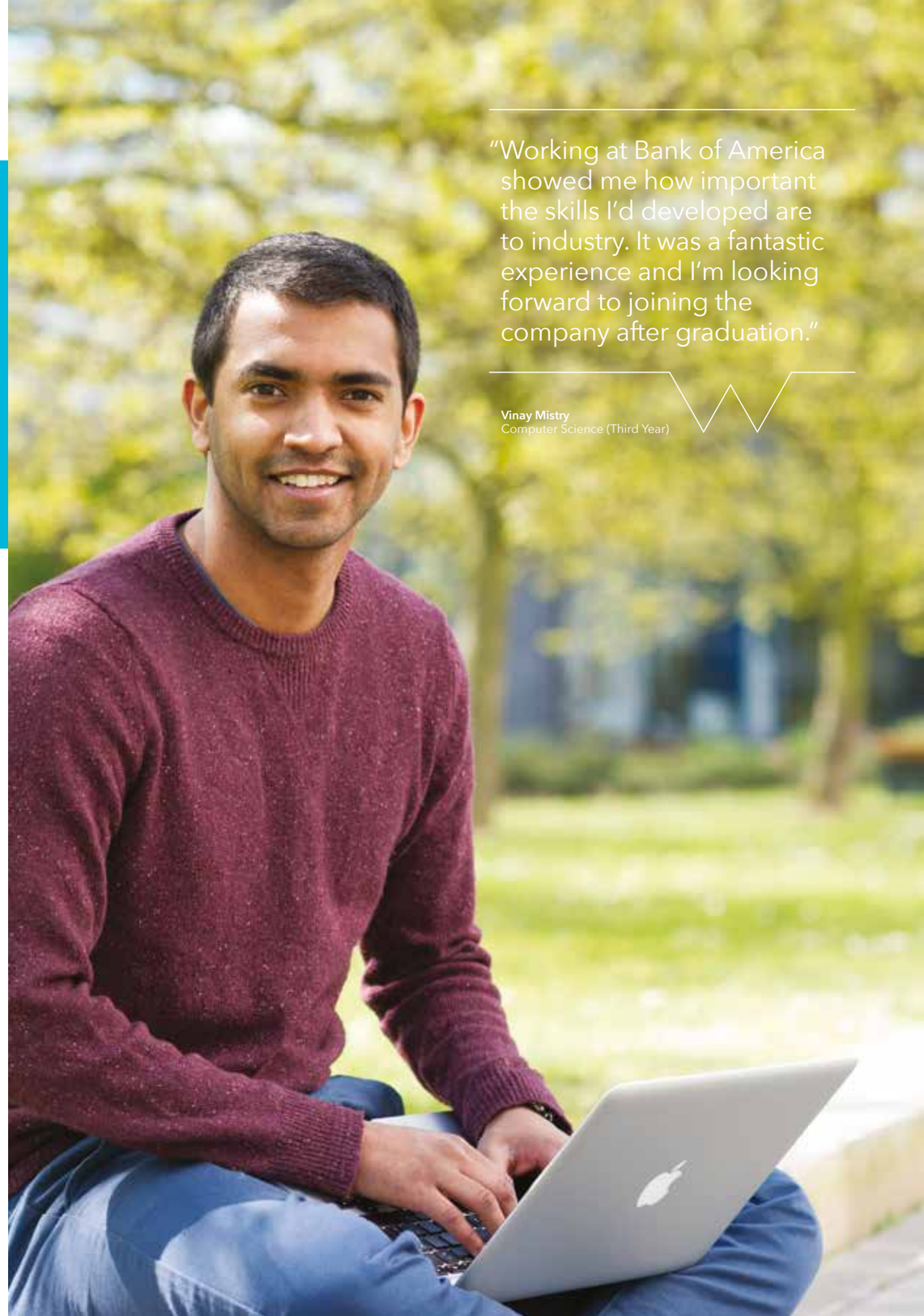
Our graduates are highly sought after by premier graduate employers, who appreciate the rigour and industrial relevance of our degree courses.

This means that our students have a great deal of freedom in deciding on their career path, with the majority having a host of exciting options open to them on graduation. Sectors popular with our students include software engineering, technical consultancy and financial services.

We work closely with the University's highly regarded Student Careers and Skills Centre to offer guidance and support on graduate employment, including application reviews, interview preparation and one-to-one advice. We also have a dedicated departmental careers advisor. In addition to the University's careers fairs, our students benefit from departmental careers events including our annual flagship "Computing Your Career", where we host multi-national organisations with whom we have long-standing partnerships.

"The relationship we have with the Department of Computer Science allows us to work alongside outstanding students with the knowledge and skills to make a substantial contribution to any organisation. Their technical ability, work ethic and communication skills are second to none."

Charles Elliot
Global Head (Trading Surveillance Technology), Deutsche Bank



"Working at Bank of America showed me how important the skills I'd developed are to industry. It was a fantastic experience and I'm looking forward to joining the company after graduation."

Vinay Mistry
Computer Science (Third Year)

"Everyone at Warwick made arriving from Singapore really smooth. The Department felt like home from my first day. Right now I'm looking forward to working at Google and bringing that experience back to my projects at Warwick next year."

Rayhaan Jaufeerally
Computer Science (Second Year)

Overseas Students

As a university with an international reputation for excellence, we welcome students from all parts of the world. One-third of Warwick students are from overseas, coming from nearly 150 different countries. This creates a lively and vibrant environment in the Department and across campus, benefitting our whole community.

The Office for Global Engagement supports all our overseas students, from application through to graduation. They offer information on how to prepare for arrival in the UK and life at Warwick. The Office for Global Engagement also offers a full orientation programme to welcome students and provide a range of activities to help students make the most of their time at Warwick.

There are many international cultural societies, each of which organises their own events throughout the year. Every year all of these societies join together for One World Week, an international festival of music, costume, drama and dance. The festival is one of the biggest of its kind in Europe.

More information on how overseas students are supported at Warwick can be found at: www.warwick.ac.uk/study/international

We believe that at Warwick every student is an international student. All of our students emerge from Warwick as global citizens, international rather than insular in knowledge, skills and outlook.






Applying to Warwick

All undergraduate applications must be made electronically through UCAS (www.ucas.com).

University open days are held throughout the year. Home applicants who receive an offer of a place are invited to attend a departmental open day. These events are an opportunity to visit campus, meet current students and staff, and learn more about studying at Warwick. If you are unable to attend a departmental open day, we are happy to arrange a personal visit. This can be organised by contacting our admissions team.

We do not typically interview candidates. Offers are made on the basis of predicted and achieved grades, as well your personal statement and references. Occasionally some applicants may be interviewed, for example candidates returning to study after a long break or those with non-standard qualifications.

Overseas applicants can obtain guidance from their school, college, local British Council branch or UKCOSA.

If you have any concerns or queries regarding your application to study at Warwick please contact our admissions team.

Email: ugadmissions@dcs.warwick.ac.uk

"We pride ourselves on our ability to attract students who will go on to be leaders in science and industry. Our courses are specifically designed to challenge even the most able of students, which is precisely why a degree from Warwick is so highly regarded."

Dr Matthew Leeke
Director of Admissions and Recruitment

dcs.warwick.ac.uk

WARWICK
THE UNIVERSITY OF WARWICK

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