

DEPARTMENT OF COMPUTER SCIENCE

CONNECTING WITH TOMORROW

In the last few decades, Computer Science has driven significant and rapid change in all areas of modern life, and its importance will only increase as we work to optimise social, technological, and economic development. As technology advances, the importance of storing, processing and communicating digital information can only increase.

At Reading, the Department of Computer Science is a community of dynamic, inquisitive thinkers working to solve the problems of the 21st century through technology. We have particular strengths in areas such as data science, big data analytics, machine learning, artificial intelligence and high performance computing; 100% of our research impact has been classed 'outstanding' or 'very considerable'.[^]

Our location in the heart of the UK's IT sector allows us to collaborate and forge partnerships with some of the brightest minds in our industry.

Our staff and students are working together to push the frontiers of computer science, and we hope that you will choose to join us.

www.reading.ac.uk/computer-science

“The best way to predict the future is to invent it.”

Alan Curtis Kay

LOCATION LOCATION LOCATION

Reading is one of the largest areas for technology jobs outside of Silicon Valley. From start-ups and SMEs to multinational companies such as Microsoft, Oracle, Sony and IBM, future employers are right on your doorstep – and, thanks to our links with industry, they know exactly where to find you.

You will be ideally located to learn more about possible career paths directly from some of the best companies in the industry. Many of our students take up work experience or a professional placement year with these companies, gaining a competitive edge in the job market and forming professional connections with future employers.

The concentration of technology professionals also means that our students can participate in numerous social and developer groups that meet regularly in the area, taking the opportunity to hone skills outside the classroom, meet inspirational people and learn about their experiences in industry, and hear from experts on the latest breakthroughs.

Our connections with employers also allow us to continually review our courses to ensure they meet the needs of industry, with major companies actively providing input through our Industrial Advisory Board. Companies currently participating are Sony, Microsoft, Nationwide Bank, IBM, Optimal Monitoring and Elanco. Students regularly attend seminars given by speakers from industry on topics of interest, and the Department runs an annual careers fair to allow you and the companies that attend to connect.

BSc COMPUTER SCIENCE

BSc COMPUTER SCIENCE WITH INDUSTRIAL YEAR

Our degrees aim to develop your knowledge of the theory and practice of modern computer science.

Study the theory and techniques that underpin areas such as complex computing systems, big data analytics, computer graphics, information security, web technology, mobile computing, networking and data science and artificial intelligence. You will have the opportunity to develop your technical skills in: programming including C, C++, Java and Python; algorithms and tools for data analysis; and software system design and testing. Enhance your transferable skills such as critical thinking, problem-solving,

professional writing, and team working which are sought after by employers in a wide variety of industries.

You can apply to take this course as a four-year degree with an industrial placement year*, giving you paid real-world experience in your chosen field. We will support you throughout the application process, and we will keep in regular contact with you during your year in industry.

These courses are accredited by BCS
— the Chartered Institute for IT.



Year one modules include:

Fundamentals of computer science
Applications of computer science
Programming in C/C++
Software engineering: fundamentals and professional development
Mathematics and computation
HCI and web applications

Year two modules include:

Computer architecture and networking
Algorithms and operating systems
Databases and information security
Compilers
Programming in Java
Software systems design with UML
Software engineering: quality and testing
Service-oriented system applications
Programming in Python for data science

Year three modules include:

Distributed systems and parallel computing
Artificial intelligence
Data science algorithms and tools
Social, legal and ethical aspects of computing
Visual intelligence
Virtual reality
Blockchain computing
Image analysis
Data integration and visualisation
Text mining and natural language processing

The final year also includes an individual project, worth 40% of marks for the year, where you will plan, design, implement, test, evaluate and present on a project of your choosing.

The Department also offers BSc Mathematics with Computer Science and BSc Mathematics with Computer Science with a Placement Year in partnership with the Department of Mathematics and Statistics; see www.reading.ac.uk/maths for information.

* See placements disclaimer on back inside fold



YEAR IN INDUSTRY STUDENT PROFILE

leuan Higgs chose to study the BSc Computer Science with Industrial Year, and undertook a paid year-long placement with Evertz Microsystems as a broadcast engineer.

“ I chose to study at Reading for a number of reasons. One reason was the flexibility provided by the Department to switch from doing a regular three year degree, to a degree with a year in industry – this opened up the opportunity to go on the placement, which has helped me to learn and has also helped alleviate some student financial stress.

Fortunately, my job was close enough to Reading that I was able to continue living with my friends from the University during the year. I found that my studies had set me up nicely with a strong background of knowledge and skills to begin my placement – especially the programming, databases and design-related content. I also learned a whole new set of skills from my placement that I am looking forward to applying during my final year of study.

I believe that the year in industry has been valuable and would recommend it to any students currently considering it. ”

leuan Higgs
BSc Computer Science with Industrial Year



MODULE SPOTLIGHT: DISTRIBUTED SYSTEMS AND PARALLEL COMPUTING

This module introduces concepts, principles, tools, techniques, and algorithms for distributed systems and parallel computing, and examines the deployment of relevant applications in the cloud, big data analytics, and massive-parallel environments.

Distributed and parallel computing is omnipresent in our daily lives, providing the compute and storage capabilities for our personal needs and likewise global enterprises.

By powering computational science, it enables breakthroughs across scientific disciplines, attracting researchers and computer scientists alike to study concepts and push the limits.

Our Department works with institutions and companies for which distributed and parallel computing is mission-critical, such as the Met Office and European Centre for Medium-Range Weather Forecasts. The expertise we develop through these partnerships enables us to teach this module from a practical perspective.

“ This module provides useful and enjoyable insights into the world of high-performance computing and how it is applicable to almost any working environment. ”

Lewis Braley
BSc Computer Science with Industrial Year

MODULE SPOTLIGHT: APPLICATIONS OF COMPUTER SCIENCE

“ The famous Computer Scientist Edsger Dijkstra observed that “Computer Science is no more about computers than astronomy is about telescopes”. As such it is important to consider not only how computers work but also how they can be used. One of the key first year modules is Applications of Computer Science, where, in four strands, we describe some modern uses of computers.

The first strand considers Artificial Intelligence, both the more rule based and the biologically inspired approaches – in the latter we consider neural networks and genetic algorithms.

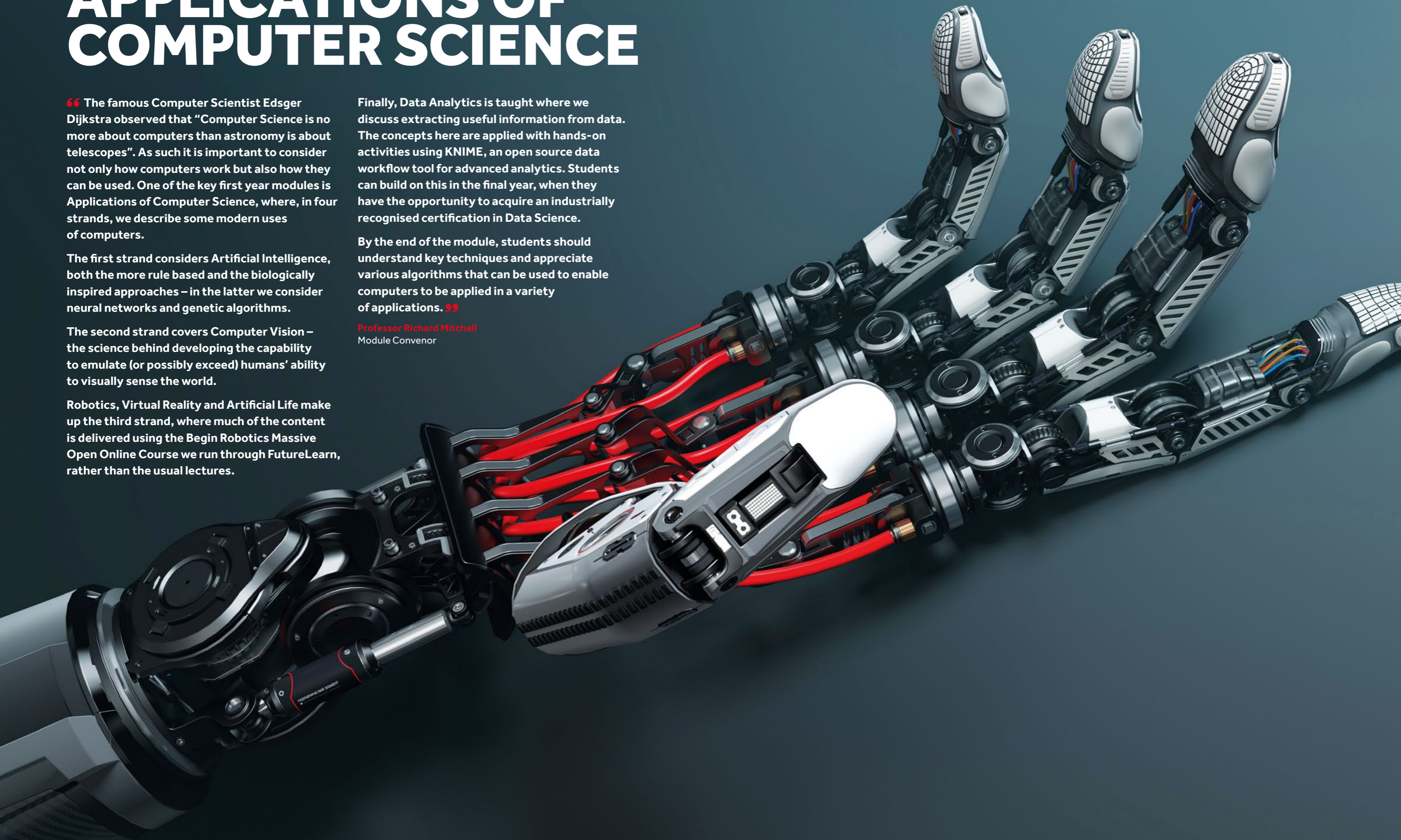
The second strand covers Computer Vision – the science behind developing the capability to emulate (or possibly exceed) humans’ ability to visually sense the world.

Robotics, Virtual Reality and Artificial Life make up the third strand, where much of the content is delivered using the Begin Robotics Massive Open Online Course we run through FutureLearn, rather than the usual lectures.

Finally, Data Analytics is taught where we discuss extracting useful information from data. The concepts here are applied with hands-on activities using KNIME, an open source data workflow tool for advanced analytics. Students can build on this in the final year, when they have the opportunity to acquire an industrially recognised certification in Data Science.

By the end of the module, students should understand key techniques and appreciate various algorithms that can be used to enable computers to be applied in a variety of applications. 99

Professor Richard Mitchell
Module Convenor



PLACEMENTS

Gain valuable work experience and explore your career options by taking a short placement or year of professional experience during your studies.

If you take our course with an industrial placement Year, you will receive support from our central placements and careers team who will provide tailored training and support throughout your programme to ensure you have every success at securing a fulfilling placement opportunity. The Department will stay connected with you and visit you at least once during the placement year. We also have a summer placement option for students preferring to take a shorter placement in the curriculum and offer many other paid internship schemes and programmes through the Careers and Placements Team.

You will have the opportunity to take advantage of the preparation and support offered through the whole process including: help identifying industries suited to your individual career interests; having your CV and application forms reviewed; building your confidence for interviews, tests and assessment centres; and receiving feedback.

We also offer a series of employer-led interactive seminars in your second year. Placement providers specifically looking to recruit Computer Science students run these sessions, covering

introductions to their company, the opportunity to hear from current or previous interns, and the placement opportunities available at the company, before delivering key advice and tips for a specific element of the recruitment process. Employers who have recently delivered these sessions include Eli Lilly, CGI, G Research, and Waterstons.

Previous students have taken on roles including:

- Data Analyst, Urban Science
- Intern Cloud Developer, Oracle
- Cyber Response Business Analyst, Invesco
- SharePoint Developer – Bayer
- Software Engineer – BAE Systems
- Business Analyst – Eli Lilly
- Developer – FunTech
- Full Stack Software Developer – Veritas Technologies LLC
- Design and Development Engineer – Think Engineer

“ We encourage placement students to undertake as much learning as possible while they are with us including taking further accreditations, joining in our internal knowledge sharing sessions and taking an active part in developing the business even for the short time they are with us.

Taking on placement students is a great way for Waterstons to find talented individuals before they finish their studies and we offer the majority of our placements a graduate role on completion of their degree.”

Lesley Renteurs
HR Officer, Waterstons (business IT consultancy)

“ During my placement year at Eli Lilly, I was able to further both my personal and technical development. I was exposed to a range of business units, giving me various opportunities throughout the year, the biggest being a speaker at the Salesforce world tour at ExCeL London. I was then able to use all my experience from my placement to secure myself a graduate job at Sword Apak the Christmas before graduation. This was a major relief allowing me to concentrate on my studies.”

Jules Gribble
Developer, Sword Apak (banking software)

CAREERS



Gain more than a degree. Study Computer Science at Reading and you'll also learn a range of transferable and technical skills that are highly valued by employers.

At Reading, we do our best to prepare you for a rewarding and challenging career in the areas and technologies of your choice, whether that be commercially-focused or research-based.

We host workshops, mock-interviews, and a number of careers events throughout the year, including speakers from industry, supporting you to identify career options and preparing you for success. 93% of our graduates are in work and/or further study within 15 months of graduating; of those in full-time employment, 100% are in graduate level roles.*

Many of our graduates join employers ranging from small start-up companies to multinationals such as CGI, Eli Lilly, JP Morgan, Sage and Sony Interactive Entertainment Europe.

Use your skills to innovate and create solutions in the software industry, including networking, programming, consultancy, computer security, database management, game development and systems engineering.

You may choose to pursue a career using the strong transferable skill set gained during your studies, communicating and demonstrating your valuable knowledge through public service, teaching, or IT support. Alternatively you may wish to follow your own path by starting a business, contributing your unique ideas to whatever field inspires you.

* Latest Graduate Outcomes Survey 2018/19; first degree computer science responders

STUDENT COMMUNITY

The Department works to foster a sense of community amongst our students. We have offered social and extracurricular options including staff-led clubs such as Extreme Programming, Linux User Group, and the Data Science Hackathon. Our student-led society, R. U. Hacking?, is open to students across the University with an interest in technology.

“ R. U. Hacking? is a technology society that’s open to newcomers and seasoned techies alike. We work to provide exciting opportunities for our members to build their skills as well as their professional network. It’s also a great way to get to know students in our community from across the different years.

Our activities and social events are the perfect opportunity to collaborate and learn. We hold annual 24-hour hackathons which are affiliated with Major League Hacking, the official student hackathon league. These events give you a chance to turn your ideas into reality, learn new skills in a friendly supportive environment, and meet students from other disciplines.

We also work to build strong links with local leaders in industry, such as the GDG (Google Developer Group) Reading, who attend our events to provide talks and workshops. This is a great way to talk to people in different roles and get career inspiration - and gives you a foothold for looking for placements or employment opportunities.”

Andrejus Kostarevas
BSc Computer Science



Disclaimer

This brochure was issued in 2022 and is aimed at prospective undergraduate students wishing to apply for a place at the University of Reading (the University) and start a course in autumn 2023. The University makes every effort to ensure that the information provided in the brochure is accurate and up-to-date at the time of going to press (May 2022). However, it may be necessary for the University to make some changes to the information presented in the brochure following publication – for example, where it is necessary to reflect changes in practice or theory in an academic subject as a result of emerging research; or if an accrediting body requires certain course content to be added or removed. To make an informed and up-to-date decision, we recommend that you check reading.ac.uk/study

The University undertakes to take all reasonable steps to provide the services (including the courses) described in this brochure. It does not, however, guarantee the provision of such services. Should industrial action or circumstances beyond the control of the University interfere with its ability to provide the services, the University undertakes to use all reasonable steps to minimise any disruption to the services.

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Modules disclaimer

Sample modules are provided as a taster of some of the modules that may be available on each course. The sample modules listed may be compulsory (core) or optional modules. Information is correct at the time of going to press (May 2022) but the University cannot guarantee that a module appearing in this list will definitely run. Teaching staff on specific courses or modules mentioned in this prospectus may be subject to change.

For optional modules, the University cannot guarantee that all optional modules will be available to all students who may wish to take them, although the University will try to ensure that students are able to take optional modules in which they have expressed interest at the appropriate time during their course. Optional modules vary from year to year and entry to them will be at the discretion of the Programme Director.

Joint courses disclaimer

Our joint courses may have extra requirements, including English language requirements. Please check the individual course pages on our website for further details.

Year abroad and placement fees

Some courses include an optional or compulsory year abroad or placement year. During this year you will only pay a partial fee which is currently set at 15% of the normal tuition fee. Check the website for the latest information: reading.ac.uk/fees-and-funding

Placements disclaimer

Programmes with a Professional Placement Year (also known as 'Year in Industry' or 'Placement Year') are fully dependent on students securing their own placement opportunity, normally through a competitive recruitment process. The University provides dedicated career and application support for placement year students. Students who do not secure a placement or who are unable to complete the placement year due to extenuating circumstances, have the option to transfer to a three year variant of their programme with agreement from their School/Department.

Placements disclaimer

The partnerships listed are correct at the time of publication (June 2022). For up to date information on the University's partnerships contact studyabroad@reading.ac.uk.

Where Study Abroad is not a compulsory part of the degree programme, the University of Reading cannot guarantee that every applicant who applies for the scheme will be successful. Whilst efforts are made to secure sufficient places at partner institutions, the number of places available and the University's partners can vary year-on-year. In all cases, the University cannot guarantee that it will be possible for applicants to choose to study abroad at a particular institution.

Further, certain courses and/or institutions may require you to satisfy specific eligibility criteria. It can be a competitive process. For further information on the University's Study Abroad Scheme please contact studyabroad@reading.ac.uk



Department of Computer Science
www.reading.ac.uk/computer-science

Ask us a question
www.reading.ac.uk/question

