Computing and Communications
Undergraduate Degrees 2023
Imagine being able to possess the computing skills to bring your creative ideas into a reality, and to literally have the power to transform other people’s lives. Computing and Communications is at the heart of a digital revolution that is touching all aspects of science, healthcare, business, entertainment and society, and that is why I’m proud to add two new degrees to our portfolio, Data Science and Cyber Security, both growing areas where skilled graduates are in demand.

Our degree programmes will push your ability to solve complex problems, develop your data analysis skills and develop software that provides new, genuinely valuable technologies to society. A computing degree is so much more than just computing as a technology, which is why we are passionate about helping you discover the fascinating and wide-ranging skills to unlock your potential.

All of you will have had your education impacted by Covid-19 in some way, and, for some of you, you will be coming in as an undergraduate with less confidence and less experience than in previous years. We therefore want to reassure you, that we will be putting support mechanisms in place, particularly throughout your first year to ensure that you have all the skills that you need to progress through your degree. Our admissions process will also reflect these changes - you will not be disadvantaged if you are unable to include extracurricular experiences in your personal statement and in cases where exams have continued to face any disruption we will be as flexible as possible in our offers.

University is so much more than just the academic programme, so we strongly recommend that you visit us or join one of our digital events to find out why we believe Lancaster is a great place to study!
In 2020 the world suddenly changed, and with it, our reliance on computers increased exponentially. Software kept us connected at a time when we couldn’t see friends or family. Data science kept us safe as the pandemic numbers grew and fell. Computer games kept us entertained when we couldn’t go out. Cyber security experts worked to protect systems we depended on more and more. From our own planet, software landed a new Rover on Mars. It’s safe to say the last few years would have been very different without the work of computer scientists.

As a computing graduate you’ll be in high demand across a wide range of industries. Technology is constantly evolving and your degree will help to prepare you for future roles that don’t even exist yet. It’s a really exciting time to be a computer scientist!

Alongside your academic studies at Lancaster you will have the opportunity to enhance your CV through internships and placements throughout your degree. Dedicated staff match you with businesses for placements and internships, or even help you start your own business!

InfoLab21 houses our School of Computing and Communications, and is the region’s leading centre for ICT research and commercial innovation, collaborating with companies such as Google, BBC, Samsung and Microsoft.

You’ll be learning on a balanced programme which combines deeper theory with plenty of hands-on experience. This blend equips you for a highly dynamic workplace and ensures immediate value to you and employers on graduation, as well as a lasting foundation for the future.

We want you to understand computing, from where it’s been, to where it’s going, why it matters and how it can help with all sorts of real-world problems. Our courses take you from programming, analysis and computational thinking, through system architecture, networking, graphics, extended reality, human interface and interaction design, artificial intelligence and cyber-security, sustainable computing, digital health, and beyond, to creating robust, secure, useable software to meet real people’s needs.

For more information please visit lancaster.ac.uk/scc

A place for the innovator

At no point in history has computing and communications been more central to innovation.
When I came to the University on my offer holder day it was the conversations with the academic staff and the interactive workshops they ran that convinced me that Lancaster was the place for me. Getting to see the passion the academics have for their subject and how this translated into teaching was a great eye-opener for me, and happily, this has translated into three years of immense learning and uncovering my own enthusiasm for computer science.

Coming into University I had some programming experience through high school, but what I didn’t yet appreciate was the breadth of the subject and how programming can be applied in so many different scenarios. Through the second year Databases and Computer Networks, and the third year Distributed Systems and Artificial Intelligence modules I discovered how computer science and coding extend to so much more than just making games, as is commonly perceived. Saying that, one of my favourite modules was the Computer Science Group Project in my second year. In this module, I worked alongside four other students to plan, design, and implement a 2D arcade-style game. This was a great experience as it gave us creative freedom that we hadn’t yet experienced, allowing us to choose every detail of our game within the very loose specification. It also taught me invaluable skills in working with and managing other people, particularly accommodating different abilities, ensuring everyone’s voice is heard, and managing conflict within a group.

There is also a huge amount to computer science outside of programming. These aspects are covered in ethics modules and Human-Computer Interaction (HCI). The ethics modules provide a great insight into the role computer science plays in society and each of our individual responsibilities as programmers to use our abilities to positively impact the world. Similarly, HCI gives you an appreciation for how people interact with the systems we create, and how best to design these systems to accommodate the needs of users.

One aspect of the course I was worried about coming to university was the mathematical side. Coming from a surprisingly common background of Computer Science, Business, and History at A level, I was worried my lack of higher maths qualifications would hinder my progress, as many of the top universities had it as a requirement at A level. My fears around this were quickly alleviated, as all the maths required for the course was covered early on and was much more manageable than I anticipated. The last three years have shown me that, although maths definitely has its place in computer science, it is possible to achieve just as highly coming from non-traditional academic backgrounds.

The course has made clear to me the direction I want to head in with my career, and when I graduate this summer, I will be starting as a Software Engineer at an exciting, fast-paced technology company in the Midlands. The range of content I have learned and the passion with which I was taught at Lancaster have been pivotal factors in me achieving this long-held ambition.
Somewhere to be involved!

**Computer Science Society**
We work closely with the School to provide exciting opportunities for you to engage with alongside your degree. We facilitate talks from industry, guest lectures, career development opportunities and more! Join us and get involved in a range of projects, from the small and simple to the long-term and ambitious. You can even get funding for your own idea if you have one! All students benefit from our peer-led support sessions for your academic studies, ranging from workshops to lectures.

**LUHack**
Founded in 2014, the Lancaster University Ethical Hacking Group (LUHack) is a group of individuals who meet weekly to learn and practise ethical hacking in a safe (and legal!) environment. Anyone can learn the basics of hacking in the first semester before moving onto advanced topics and regularly attending conferences and competing in Capture the Flag competitions.

**Women++@InfoLab**
Women++@InfoLab supports marginalised groups of staff and students within the School Of Computing and Communications. There are opportunities to meet up, as well as networking lunches, talks from industry representatives and academics, and workshops. This year we hosted the annual British Computing Society Lovelace Colloquium, and many of our undergraduates had the opportunity to present posters.

For more information please visit lancaster.ac.uk/secc
I admit, I had never been to Lancaster before applying due to a very last-minute application, however to this day, I consider it one of the best decisions I was ever lucky enough to make. Lancaster has an incredible campus and atmosphere that genuinely makes it feel more like a community than a university, and it is one I felt welcomed into from my very first day.

The opportunities provided by different societies on campus alone makes it an incredible experience. While at Lancaster I have been able to do things like get involved with the LGBTQ+ community on campus (including getting to run the University’s Instagram story at pride last year) and also take up fencing, a sport that I have enjoyed throughout my time at Lancaster. The University has so many opportunities to not only develop your academic skills, such as the Computer Science Society or Ethical Hacking Society, but also the opportunities to develop other interests. Whether it is sports, activism or even baking, Lancaster has a group and a community just waiting to welcome you. And with such a great campus with plenty of facilities and open space, the opportunities are purely limited by if someone has had the idea yet.

However, even with all these incredible opportunities, one of the most welcoming environments at Lancaster has undoubtedly been my department. As a student with ADHD and Autism, I have always felt supported by the department who do everything they can to help students with disabilities get the most out of their time at university and encouraging them to take part in extra opportunities. One of the ways they do this is by always looking for feedback on how to make things better by talking to students and involving them in the process to ensure everyone gets heard. Things like the academic rep scheme, or the departments Equality Diversity and Inclusivity committee are just some of the ways the staff work to ensure students are given opportunities to make their voices heard by the department.

My course hasn’t always been easy as I had not done computer science at college, but the academics who teach us soon changed that. The support they provide and enthusiasm they have for their subjects helped to provide insight and inspiration to help me now really love my subject. My department and the University has helped me grow in ways I never could have even imagined!
There’s a whole host of different types of support available to you when you come to university, whether it’s helping you settle into your new accommodation by talking to your College Advisory Team, or getting some help with your course by coming to one of the School’s weekly drop in sessions run by our Senior Teaching Associates.

You’ll meet your Academic Advisor in your first week of university, and they will be here to help you with any course issues or queries you may have.

Our Computer Science Society also provides peer-led support sessions and weekly Internet cafes.

The Lancaster Success Programme (LSP) is designed to support students from backgrounds that are traditionally underrepresented at university, who may not always be aware of the breadth of support and opportunities available to them.

Eligible applicants will be invited to join the scheme in the summer prior to starting university and are offered a programme of activities to enable them to thrive during their studies and successfully progress into graduate employment or postgraduate study. More information can be found at: www.lancaster.ac.uk/student-success

For more information please visit lancaster.ac.uk/ssc
I have had a wonderful two years studying Computer Science at Lancaster University. The department has been great at offering support for both years of study I have completed so far. My first year at Lancaster was all done online due to COVID-19, however I still managed to get the most out of my degree by engaging with the content and the practical sessions available to me where I was really able to test my skills. My second year has been very different as it has transitioned back to in-person sessions and I am really enjoying it all, it has definitely been more challenging than last year but in a good way! I’ve studied a large range of topics from ethics to advanced programming which I wasn’t expecting but it’s been great, as every module offers something different but of equal value to the rest. Being able to engage with other Computer Science students has been wonderful and I’ve made a lot of friends on the course which has made the experience even better. It’s really nice having other people relate to me academically.

I have engaged with a number of societies whilst I’ve been here, and I’ve joined a few that really interested me. I became a part of the Taylor Swift society and the Filipino society; they’ve really helped me branch out and make more friends! I wanted to join the Filipino society as growing up I didn’t have many Filipino friends and I wanted to get more involved in my culture, so I was really happy to find there was a society set up celebrating our heritage, which made connecting with other Filipinos much easier! I regularly attend the Taylor Swift society events as well and I’ve found the meetings so much fun and all of the members so friendly and outgoing. I was worried before coming to university that I wouldn’t find any societies that I was interested in, but that has not been the case at Lancaster - they really do have a society for everyone!

I instantly felt at home when I moved to Lancaster, and even though I live in the city now, I really loved living on campus in my first year! I loved the accommodation it was so comfortable; I still miss my first-year bedroom sometimes! I felt very safe on campus because there were always people walking around, at all hours of the day. I really enjoyed the Roses tournament this year and am looking forward to Extrav after the exams finish. There are so many things to get involved with sometimes it’s hard to keep up!
Degree schemes

BSc Hons Computer Science G400

You will obtain a broad yet rigorous grounding in this innovative discipline, with a strong emphasis on experimental computer science.

In the first year, you will receive a comprehensive understanding of the fundamental principles of the discipline, combined with their modern day application.

Throughout your study, you will gain skills and experience from a range of modules, and you’ll be taught from all five main themes of computer science, studying topics such as Software Development, Data Engineering, Secure Cyber Systems, and Professionalism in Practice. Taking a practical approach to learning, you are encouraged to build and analyse systems and software, as well as work with end user feedback to refine and adapt solutions.

After gaining an overview of the subject in the first year, you will be motivated by topics that become progressively deeper and more specialised as your skills develop throughout second and third year. From term two in your second year, most of your modules become optional choices, allowing you to tailor your studies to your own interests and future career aims. These include modules such as Concurrent and Parallel Systems, Sustainable Computing, Deep Learning, Embedded Systems, and Secure Artificial Intelligence.

Your final year gives you the opportunity to explore a range of well-constructed and enriching modules, as well as undertaking an individual project with one of our academics, allowing you to use and further develop the skills acquired throughout your degree.

As well as these options, you will undertake a dedicated group project in second year and an individual project with one of our academics in your final year. These allow you to use and further develop the skills acquired throughout your degree and demonstrate your ability to work on real-world tasks for post-graduation employment.

Our degrees are built from a range of modules encompassing five main themes of computer science:

Software covering programming languages and how to make software

Data and Algorithms covering the theoretical foundations of computer science, data engineering, and different types of artificial intelligence

Systems covering how software and hardware interact within computers and across networks

Interactions and Implications covering professionalism, ethics, computing's impact on the world, and how people interact with computer systems

Cyber Security covering the theory and techniques to identify and protect physical, software, and AI systems

MSc Computer Science G404

Your first three years will be spent alongside your companions on the BSc, but as they graduate, you’ll be preparing for your fourth year, where you’ll be studying Masters-level modules, and undertaking an industry placement, giving you an advantage in the global job market.

Your modules will include Research Methods and Innovation, to teach the more advanced skills expected of Masters students in your future research or industry destinations, and for your placement we will set you up with a partner organisation or research group, which fits your skill set and builds on your existing knowledge.

Can’t decide whether to apply for the BSc or MSci?

That’s fine! You can use just one of your UCAS choices - those students who do not achieve their conditional offer for the MSci will automatically be offered a place on the BSc, providing these entry criteria have been met (see page 24). You can also change when you get here from one to the other anytime through to Easter of your 3rd year, providing you are achieving the minimum required grades as you go along.

Can’t decide which degree scheme to apply for?

That’s fine! Our Computer Science, Software Engineering, Cyber Security, and Data Science* degree schemes all have a common first year to provide the broad foundation that any computing professional should know. This means you can switch to a different scheme during first year.

*Switching to Data Science requires having taken a Mathematics & Statistics minor option during first year.

For more information please visit lancaster.ac.uk/scc
BSc Hons Software Engineering G602

Your first year will provide you with the fundamentals of computer science, software development, professionalism, and digital systems, allowing you to gain the essential knowledge needed for analysis and design. In addition to developing your foundational understanding, programming, and software design skills, you will explore social, ethical and professional issues related to the discipline, which will allow you to develop the working knowledge and skills to overcome the challenges of designing, developing and evaluating real-world software systems.

Your second and third years offer advanced topics including Algorithm, Operating Systems, Computer Graphics, Deep Learning, and Advanced Networking. You will also undertake a variety of software engineering specific design studio modules, ensuring you gain a broad and robust level of skills and experience in team-based software development. These projects will also develop your data analysis, graphical, report writing and presentation skills.

MSci Hons Software Engineering G601

Your first three years will be spent alongside your companions on the BSc, but as they graduate, you’ll be preparing for your fourth year, where you’ll be studying Masters-level modules, and undertaking an industry placement, giving you an advantage in the global job market. For your placement we will set you up with a partner organisation or research group, which fits your skill set and builds on your existing knowledge.
BSc Hons Cyber Security

The importance of Cyber Security is widely recognised in modern society. Skilled experts are in high demand, and as a NCSC recognised Academic Centre of Excellence in Cyber Security Research and in Cyber Security Education, we have extensive expertise in the field.

If you’re an aspiring cyber security systems engineer or architect looking to exploit the latest cutting-edge cyber security research to build modern, resilient and secure computing platforms then this is the degree designed for you.

As with our other degrees, in your first year you will receive a comprehensive grounding in computer science and cyber security fundamentals covering both theory and practice.

In your second and third years you will begin to specialise in areas that inspire you. You will choose six focused cyber security modules from topics that include Security and Penetration Testing, Digital Forensics, Cryptography, Network Security and Resilient Distributed Systems. You will begin to design software and systems solutions to specific problems using appropriate methodologies and tools, and demonstrate, analyse and design different approaches to undermine security and recover from security failures in modern systems based on an understanding of attackers.

This programme also includes advanced and emergent cyber security fields that draw on the expertise of our world-class research academics such as Security of Autonomous Systems, Secure AI, Secure Cyber Physical Systems and Security Metrics.

Practical sessions are supported by a ‘dynamic lab’ where members of staff and teaching assistants are available in-lab during the majority of the week to provide assistance with module content as required. This will support you in addressing small problems quickly and help your understanding.

Excitingly, the North West is receiving extensive, large scale national cyber security investment from GCHQ and NCF which will create around 5000 job opportunities. The University is building effective partnerships with these organisations who will inform this programme.

MSci Hons Cyber Security

Your first three years will be spent alongside your companions on the BSc, but as they graduate, you’ll be preparing for your fourth year, where you’ll be studying Masters-level modules, and undertaking an industry placement, giving you an advantage in the global job market. For your placement we will set you up with a partner organisation or research group, which fits your skill set and builds on your existing knowledge.

New for 2023 entry

For more information please visit lancaster.ac.uk/scc
Data science plays a vital role in all aspects of the modern world. Our BSc programme will ensure you have a strong foundation in this rapidly expanding, highly in-demand field. You will gain cutting-edge knowledge and skills through state-of-the-art equipment and excellent teaching offered by both the School of Computing and Communications and the Department of Mathematics and Statistics, delivered by academics who are leaders in their field.

In your first year, you will receive a comprehensive grounding in the theory and practical skills of computer science and gain an understanding of mathematical methods and concepts. You will also enhance your data analysis, problem-solving and quantitative reasoning skills.

In the second and third year, our academic experts will teach the significant contemporary developments in research, practice, and technology. This means you will further deepen your knowledge in linear algebra, probability and statistics, as well as computer science modules in our Software and Data and Algorithm themes. You will also take part in interesting group and individual projects designed for data scientists.

Your final year will also give you the opportunity to specialise in a range of enriching research-informed optional modules, as well as undertaking a substantial data science individual project. This will be great experience for you to draw upon in an interview and in your career.

Importantly, you will learn to recognise and apply the legal, social, ethical, and professional codes of conduct relevant to a practicing computing professional, including equality, diversity, inclusion, and sustainability principles.

For more information please visit lancaster.ac.uk/scc

New for 2023 entry

**BSc Hons Data Science**

**MSci Hons Data Science**

Your first three years will be spent alongside your companions on the BSc, but as they graduate, you’ll be preparing for your fourth year, where you’ll be studying Masters-level modules, and undertaking an industry placement, giving you an advantage in the global job market. For your placement we will set you up with a partner organisation or research group which fits your skill set and builds on your existing knowledge.
## Entry requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>A levels</th>
<th>International Baccalaureate</th>
<th>BTEC</th>
<th>Combined BTEC and A levels **</th>
</tr>
</thead>
<tbody>
<tr>
<td>G400 BSc Hons Computer Science</td>
<td>AAB</td>
<td>35 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDB / DAB</td>
</tr>
<tr>
<td>G404 MSci Hons Computer Science (With Industrial Experience)</td>
<td>AAA</td>
<td>36 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDA / DAA</td>
</tr>
<tr>
<td>G402 BSc Hons Computer Science (Study Abroad) *</td>
<td>AAA</td>
<td>36 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDA / DAA</td>
</tr>
<tr>
<td>I900 BSc Hons Cyber Security</td>
<td>AAB</td>
<td>35 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDB / DAB</td>
</tr>
<tr>
<td>I902 Msci Hons Cyber Security (with Industrial Experience)</td>
<td>AAA</td>
<td>36 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDA / DAA</td>
</tr>
<tr>
<td>I901 BSc Hons Cyber Security (Study Abroad)*</td>
<td>AAA</td>
<td>36 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDA / DAA</td>
</tr>
<tr>
<td>G900 BSc Hons Data Science</td>
<td>AAB</td>
<td>35 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDB / DAB</td>
</tr>
<tr>
<td>G903 Msci Hons Data Science (with Industrial Experience)</td>
<td>AAA</td>
<td>36 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDA / DAA</td>
</tr>
<tr>
<td>G902 BSc Hons Data Science (Study Abroad) *</td>
<td>AAA</td>
<td>36 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDA / DAA</td>
</tr>
<tr>
<td>G901 BSc Hons Data Science (Placement Year)</td>
<td>AAA</td>
<td>36 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDA / DAA</td>
</tr>
<tr>
<td>G602 BSc Hons Software Engineering</td>
<td>AAB</td>
<td>35 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDB / DAB</td>
</tr>
<tr>
<td>G601 MSci Hons Software Engineering (With Industrial Experience)</td>
<td>AAA</td>
<td>35 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDA / DAA</td>
</tr>
<tr>
<td>G603 BSc Hons Software Engineering (Study Abroad) *</td>
<td>AAA</td>
<td>36 points, with 16 from best three HL courses</td>
<td>DDD</td>
<td>DDA / DAA</td>
</tr>
</tbody>
</table>

*Our Study Abroad courses require an A level in either Computing or Mathematics (or Grade 6 HL in either subject for IB)
**Combination should be either a BTEC Diploma with 1 A level, or A BTEC Subsidiary Diploma/Extended Certificate with 2 A levels

All our courses require GCSE Grade B/6 in Mathematics and GCSE Grade C/4 in English

Students applying with an A level in Computing or Mathematics will be considered to receive a lower offer.

For more information please visit lancaster.ac.uk/scc
For those with multiple passions

Our combined honours degrees are ideal for those of you who like to have a few varied projects on the go at once. You can study modules from two different departments, allowing you to study where your interests lie.

**BSc/MSci Hons Computer Science and Mathematics**

AAA

You’ll be studying modules from two of the country’s leading research and teaching specialists in computer science and mathematics – learning about computing fundamentals like languages, logic, and software engineering whilst building your pure mathematics knowledge with algebra and analysis.

MSci students will write an additional dissertation in fourth year, under the supervision of an academic from one of the two departments. You’ll be proficient to Masters level in mathematics, computing, research methods and professional skills.

**BSc Hons Management and Information Technology**

AAB

Lancaster’s Management and Information Technology (MIT) degree has been created in partnership with business professionals to give you the ability to apply IT to business situations, evaluate technical knowledge and confidently take on project and team management in IT-related business scenarios.

You will gain a sound academic basis in management, with an understanding of the concepts, debates and issues in the areas of:

+ Change Management
+ Project Management
+ Information Technology Management
+ Information Systems Development

Accredited as a Tech Industry Gold Degree, this course helps you to stand out in the job market and opens up careers with any of our sponsor organisations.

**BSc Hons French/German/Spanish Studies and Computing**

AAB

You’ll be studying between the Department of European Languages and Culture, and the School of Computing and Communications.

Your third year will be spent living in the country whose language you’ve been studying, either working in a placement, or studying at a partner institution, immersing yourself in their culture, and progressing your language skills.

If you’re not sure about doing a combined degree, don’t forget that you get the chance to do a Minor subject in your first year of most degrees at Lancaster University too!

For more information please visit lancaster.ac.uk/scc