CARDIFF UNIVERSITY
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Computer Science and Informatics

Undergraduate
degree programmes

98%

of our students are in graduate-level jobs or further study within 15 months of graduation

Source: The Guardian University Guide 2024

Computer science and informatics holds the potential to shape our world for the better.

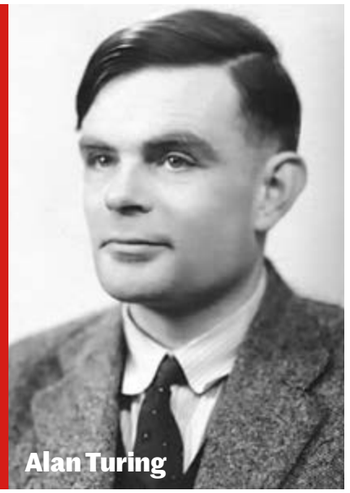
From healthcare and security to accessibility and climate change, we are driven by a shared dedication to embrace creativity and explore solutions to some of the biggest challenges we face in the 21st century and beyond.

We believe in harnessing the power of computers to improve people's lives.

We have trained computer scientists for more than half a century, and we are proud to continue inspiring the next generation now and into the future.

Your education will be shaped by our community of academics whose work has a direct impact in the world across a range of fields, including artificial intelligence, cyber security, human centred computing, and visual computing.

Our school was established in 1971. Our first Head of School, Professor Bob Churchouse, was taught by Alan Turing while studying his undergraduate degree at Victoria University, Manchester.



Alan Turing

Student experience

In Cardiff, everything starts from our strong sense of place. In computer science, we've created a base from which you can explore your individual interests, while still being supported as part of a larger community.

To help you settle into your first year, you will be allocated an academic member of staff as a Personal Tutor and an experienced student as a Student Mentor.

During your studies we'll provide you with all the basics you'll need for a solid grounding in computer science, while encouraging you to think about the wide range of paths you can choose to explore during your time with us and beyond. You'll learn the fundamentals across all our programmes, including programming languages and databases, but will be free to explore your own interests as your degree progresses.

Our programmes prioritise flexibility, allowing you to shape your degree and subsequent career path as your interests develop. Most of our courses have a common first year, so in most cases you're free to switch between programmes at the end of year one and explore more specialist areas in optional modules.

Beyond studying, if you want to dip your toes into industry or a year abroad, we'll encourage and guide you every step of the way – and we'll be here whenever you need us, ensuring that you are still a part of our community no matter where you are in the world.

We also pride ourselves on the social aspect of our community. There are a variety of societies and extracurricular activities you can get involved with, including the award-winning society CyberSoc run entirely by students, a STEM Ambassador Scheme, a Formula AI racing team, a Technocamps outreach programme, and a variety of hackathons and social events we hold throughout the year.

Computer Science or Applied Software Engineering?

We offer degree paths in both computer science and applied software engineering. Wondering which one is right for you?

A degree in computer science covers a broad range of principles, while applied software engineering is an engineering degree offering a more singular focus on the design and creation of software products.

What will you learn?

Computer science

Computer science concentrates on core concepts and technologies involved in programming a computer.

You will study how data is stored, processed, applied and kept secure by information processing systems, and you will learn programming languages, databases, operating systems, graphics, robotics and other sophisticated technologies. You will also briefly explore software engineering subjects, such as software development.

As a computer science graduate, you will be proficient in designing and building software, developing computing solutions and innovating better approaches to addressing computing challenges. Much of this will also be taught to applied software engineering students, though there will be some difference in emphasis.

Applied software engineering

Applied software engineering focuses on designing and building software systems. It teaches you to manage the whole software development lifecycle such as requirements gathering, software architecture, building prototypes, implementation, testing, deployment and maintenance, with an emphasis on agile project management and working to customer requirements.

What are the key differences?

If you want to explore a variety of topics, our computer science courses are flexible. You can choose from a range of optional modules in areas such as security, forensics, graphics, computer vision, artificial intelligence and large-scale database management.

If you're looking for a hands-on practical approach, our applied software engineering degree is centred on developing software solutions to real-world client problems. You will use a systematic approach and apply engineering principles to the entire software development process, from concept to completion.

If you're still not sure which degree is best for you, please contact our team:

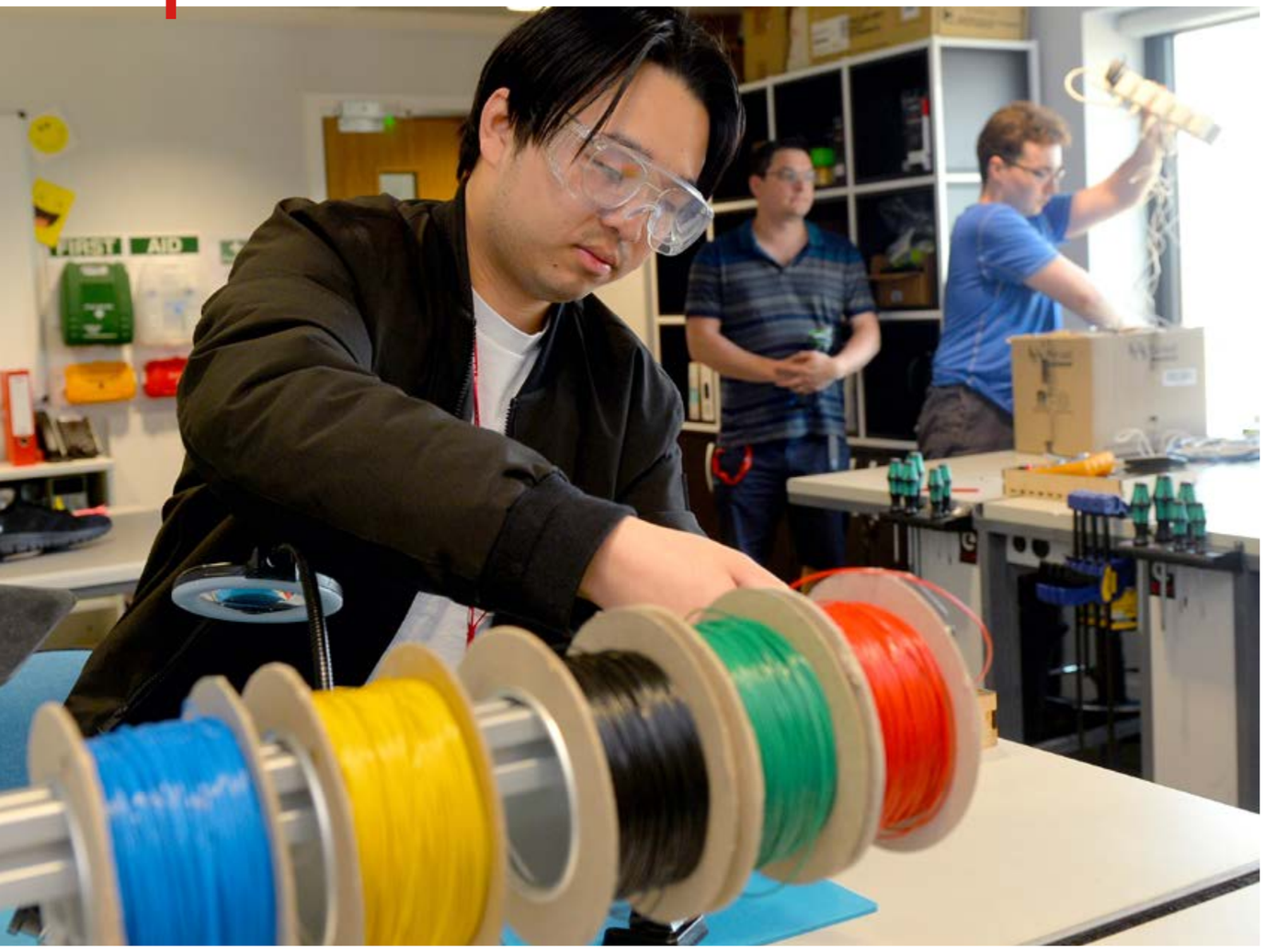
Email:
comsc-ug@cardiff.ac.uk

Tel:
029 2251 0951

"We've done lots of real-life client projects and that's definitely given me the experience and the confidence that I need to actually apply those skills to the real world."

Rhiannon,
BSc Applied Software Engineering

Year in industry and **study abroad** options



Opportunities to study abroad and gain industry experience will vary depending on the degree path you take.

If you study applied software engineering, you will benefit from work experience embedded throughout your degree, as it's a core part of the way in which you are assessed. You'll also have the option to undertake two summer work placements during your course.

If you're studying on one of our computer science programmes, you'll have the opportunity to complete a salaried year in industry or to study at one of our partner universities abroad.

Year in industry

In a competitive graduate job market, industry experience can help you gain extra skills and experience to make you stand out from the crowd. It could help you secure a permanent role after graduating, and it's a great opportunity for you to figure out what you want to do.

We have a dedicated placement officer who will help you find and apply for suitable placement opportunities. We have links with over 300 institutions across the world, and previous students have completed placements at organisations such as Admiral, Airbus, CERN, GSK, Hewlett Packard, Lloyds Bank, Red Bull Racing, and many more.

Your placement will typically last between 10-12 months and takes place in year three. You will return to Cardiff following the successful completion of your work placement at the start of the autumn semester ready for your final year of studies.

A year in industry extends our three-year BSc degree programmes to four years and our four-year MSci degree programme to five years. You don't need to commit to a placement until the start of your second year, so there's plenty of time if you're not sure what you would like to do just yet.

In addition to our year in industry, there are regular opportunities to gain relevant work experience outside of your degree through unpaid short work experience insights, paid summer internships and part-time positions.

There are also University schemes to support opportunities for academic summer research projects.

Year abroad

Studying abroad as part of your university experience is a great way to broaden your academic knowledge, immerse yourself in another culture, and gain skills that could be valued by employers.

An international experience will not only enhance your CV by demonstrating key skills such as communication, flexibility, and collaborative working but can provide you with valuable networking opportunities. You'll experience other cultures and viewpoints, make new friends from across the world, share unforgettable experiences, and you could even find yourself learning a new language.

We have partners across Europe and globally, including institutions in the USA, Canada, Australia, New Zealand, Singapore, Hong Kong and South America.

Find out more about **studying abroad**.

Facilities

In the heart of our campus and a short walk from the city centre are our two main hubs – Abacws and the National Software Academy.

Our purpose-built home Abacws was designed in collaboration with students and lecturers to create flexible and creative workspaces, with innovative teaching, study, and co-working spaces.

The building is designed to allow greater collaboration with industry in teaching and for greater interdisciplinary collaboration.

Abacws will be your primary home if you're studying undergraduate computer science, but you'll likely spend a lot of time here even if you're studying on one of our other programmes.

As a student you'll have a MakerSpace to test ideas, as well as dedicated spaces for student projects.

In Abacws we have resources for research into motion capture, 3D data capture, knowledge representation and reasoning, cloud computing, computational modelling, 'Internet of Things' research, and computational music, as well as a GPU processing farm, a dedicated cyber security lab, and an Advanced Research Computing facility (ARCCA).

If you study Applied Software Engineering, you'll be based at the National Software Academy (NSA) in the Julian Hodge Building, providing you with an innovative, start-up atmosphere for study and collaboration.

The NSA is a short, five-minute walk from Abacws and our facilities are designed specifically to mimic a workplace environment that integrates industry working practices.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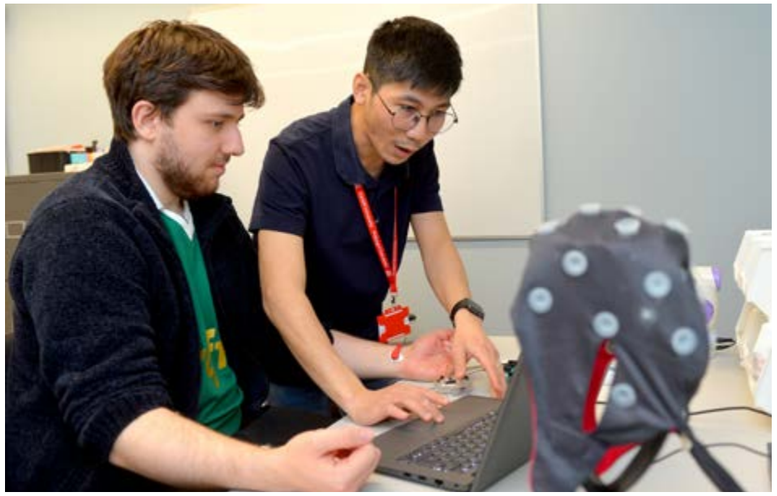

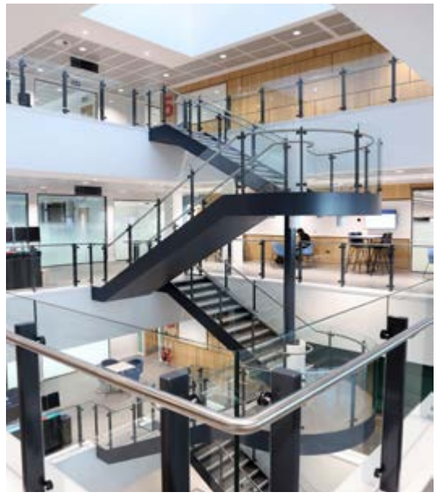


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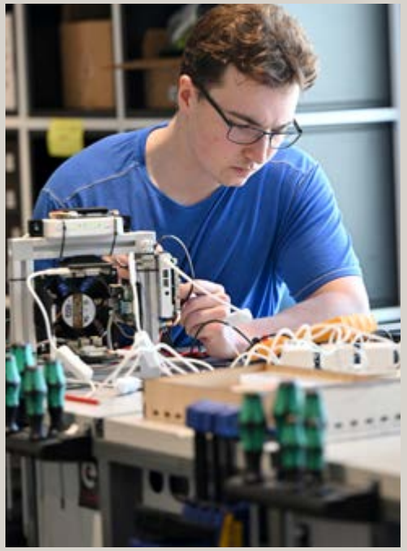


Unlock a world of possibilities

I did my undergraduate degree in computer science here at Cardiff University and now I'm doing my master's in cyber security. It's been a really interesting and fun journey so far.

"I love being in cyber security and it's something that's interested me from a young age. That's why I chose to do a master's degree now, knowing I'd get industry experience through the university, and getting to meet people from industry. That was a really exciting factor for me, which is why I chose to stay in Cardiff for my master's degree.

"It's been really fun to interact with lecturers who have so much real-world experience and know so much about industry, and they're really helpful and hands-on with everything that they share. They're always accessible and really communicative about opportunities available to us."

Jana, Graduate in Computer Science,
now studying Cyber Security (MSc) in the School of Computer Science and Informatics

Originally from the USA, I moved to the UK to study at Cardiff University. Cardiff has a great reputation for being a research-focussed university and I knew I'd get a unique and well-rounded education- and I did. I was also attracted by the fact that the university has such a large international student population- I was eager to meet and learn from students and teachers from all over the world.

"I'm currently an Engineering Manager, and have actually just accepted a new role at Moonpig, also as an Engineering Manager. After spending 7 years going from junior to midlevel to senior roles as a Software Engineer, I've now taken on a line management role where I manage 6 engineers.

"On a normal day, I attend various meetings about current and upcoming work, do a bit of coding, and have 1:1s with my direct reports where we talk about anything from how their week has been, to their career progression. I work closely with the Project Manager and Designer on our team to ensure that any upcoming work is properly refined and planned before we begin on it."

Megan, Graduate in Software Engineering,
now working as an Engineering Manager at Moonpig

Applied Software Engineering

Applied Software Engineering (BSc), UCAS code: **4JVD**

Delivered at our National Software Academy in Cardiff, this is a hands-on course for those who want to learn how to build and maintain software through real-world projects with industry clients.

You will learn how to work as a software engineer by collaborating in teams on the development of software projects for real clients drawn from the private, public and third sectors. Much of our teaching and assessments are based around these projects.

You will also get further opportunities to meet and work with practicing professionals from a wide range of organisations through networking events, guest presentations and workshops.

About the course

Year one

In your first year, you'll begin to think like a programmer - designing web applications and working with databases, coding with languages such as Java and Python, using industry-standard tools and best practices, and developing your communication and project management skills.

Year two

In year two, you will work on larger, more complex and technically difficult projects, expanding your knowledge in areas such as performance and scalability, security, and DevOps. You will also be expected to lead project meetings to plan and manage development work for a team and regularly hold meetings with customers.

Year three

In your final year, you will learn about emerging trends and use them to develop a product with an appreciation of the latest frameworks, languages, and tools. You may collaborate with other development teams and will lead customer meetings as part of a large team project. This year builds upon the experiences of years one and two and brings together all of the elements you will need in order to think and work as a commercial software engineer.

Previous students have secured work placements and even graduate jobs through the relationships they have built during their studies. Several students have even gone on to form their own start-up companies. No matter your specific interests, you will leave the Academy with the qualifications and professional skills you need to find a job as a software engineer.

> **Over my years in IT management I've found that we need to spend a significant amount of time getting graduates up to speed with what it's like working in an office.** On a course like this, you get more experience of what it's like to actually work in an IT environment."
>
> **Matt Wintle,**
> Head of Change, Admiral

Computer Science

Computer Science (BSc), UCAS code: **G400**

Computer Science (MSci), UCAS code: **G404**

Computer Science with Year in Industry (BSc), UCAS code: **G401**

Computer Science with Year in Industry (MSci), UCAS code: **G402**

Computer Science with a Year of Study Abroad (BSc), UCAS code: **126V**

Computer Science with a Year of Study Abroad (MSci), UCAS code: **G403**

In this course you'll gain a grounding in computer science more broadly, covering important theory as well as guiding you in practising and developing the transferable technical, analytical and professional skills required by employers.

Computer science is an exciting and dynamic field, full of open problems and opportunities for creative discovery and invention that touch almost all areas of life.

Because computers solve problems to serve people, there is also a significant human element to the subject.

It is about understanding computer systems and networks and how they work at a deeper level, mostly from a theoretical, mathematical and applied perspective.

The course covers a mixture of core concepts and evolving, technology-based subject matter. Not only will you develop the technical, analytical and professional skills that graduate employers are looking for, you will also be able to analyse problems objectively to develop appropriate computational solutions.

Plus, you also have the opportunity to complete a year in industry or a year abroad.

You will be based in our new purpose-built building Abacws, in the heart of Cardiff University's Cathays Campus. Featuring outstanding facilities such as:

- computer labs designed to enable group work as well as classes and individual study
- makerspace and IT workshop to support practical computer science projects
- cyber security lab for teaching and research

About the course

Our computer science courses prepare you for entry into relevant professions and are also a solid base for pursuing a research career. You don't need to have any prior knowledge or experience of computer science to complete this course, however A Level Mathematics is required for the four-year MSci degree.

Year one

We welcome students with a 'Computational Thinking' module that runs for the first four weeks of teaching, which will introduce you to the fundamentals of computing and ensure that even complete beginners will be comfortable programming within a matter of weeks. The highlight of this module is a sizeable programming project (usually, a computer game) on which you will work in a team.

Other first year modules will introduce programming algorithms using languages such as Python and Java, computer architecture and operating systems, software engineering principles, and mathematics for computer science.

Year two

Our second year modules will expand your understanding, skills, and experience by introducing more advanced topics.

We will guide you in exploring the structure and processing of data, expanding simple algorithms into applications that are able to communicate via networks, and designing and implementing a software system. You will also be able to take a selection of optional modules based on your interests across our main research areas.

Year three

You will focus on emerging technologies and advanced topics which are informed by our research. There are a number of optional modules to choose from depending on your specific interests. Contemporary topics include Cyber Security, Artificial Intelligence, and Computer Graphics. You will complete an individual project under staff supervision, driven by your interests.

Year four (MSci students only)

If you opt for the four-year MSci course, you will complete a major team project developing new research and technology under the supervision of one of our academic staff. This will compound all the knowledge you have learnt on the course, and help you to develop crucial soft skills.

"I looked at a lot of universities, but Cardiff offered the cyber security and forensics module which made it my first choice. It's an area of computer science that fascinates me and is so important right now, so was something I really wanted to study. I'm also really aware of the drive to see more women in STEM and I want to be part of the number and part of the change."

Charlene,
BSc Computer Science

Computer Science with Security and Forensics

Computer Science with Security and Forensics (BSc), UCAS code: **G4F4**

Computer Science with Security and Forensics with Year in Industry (BSc), UCAS code: **GKF4**

Computer Science with Security and Forensics with a Year of Study Abroad (BSc), UCAS code: **125V**

On this course you will gain a solid understanding of the core security, trust and privacy issues that challenge the IT sector.

We have been named as an Academic Centre of Excellence in Cyber Security Research by the UK's National Cyber Security Centre (NCSC), becoming the first institution in Wales to be given this status. In an increasingly networked world with rising computer-based crime, cyber risk is firmly at the top of global business agendas. The worldwide shortage of skilled cyber security and forensics practitioners places graduates who understand the technologies and practices that underpin secure systems in high demand.

On this course you will expand your understanding of computer science and gain an ideal grounding in preparation for specialist employment or further study in computer security or forensics.

Through a mixture of core concepts and evolving technology-based subject matter, you will cultivate the technical, analytical and professional skills that graduate employers are looking for.

Plus, you also have the opportunity to complete a year in industry or a year abroad.

You will have access to our Cyber Security and Digital Forensics Laboratory, where you can investigate incidents and explore the key security threats facing today's professionals through experiments with attacks in real-world scenarios.

About the course

Our Computer Science with Security and Forensics course will prepare you for entry into relevant professions or to pursue a research career.

You don't need to have any prior knowledge or experience of computer science to complete this course. Using current-generation tools and techniques, you will develop, maintain and monitor secure computer systems. In the third year, you will have the opportunity to explore topics such as network security, systems hardening, computer crime, forensic methods, and evidence collection.

> **"The course is challenging but it helps you to improve as a professional.** Through extracurricular activities and projects I have improved my team working and presentation skills."
>
> **Iryna ,**
> **Computer Science with Security and Forensics**

Applications

To be considered for entry onto one of our degree programmes you should apply online via the UCAS website using the 'UCAS Apply' facility.

Entry requirements

Applied Software Engineering (BSc)

Computer Science (BSc)

Computer Science with Security and Forensics (BSc)

Typical A-level Offer:
ABB - BBC

Typical Bacc Wales Offer:
Baccalaureate Wales will usually be accepted as an equivalent to one A-level

Typical Int Bacc Offer:
32-30 overall or 665 - 655 in 3 HL subjects

Other:
Applications from those offering alternative qualifications are welcome. Please see detailed admissions and selection criteria for more information.

Computer Science (MSc)

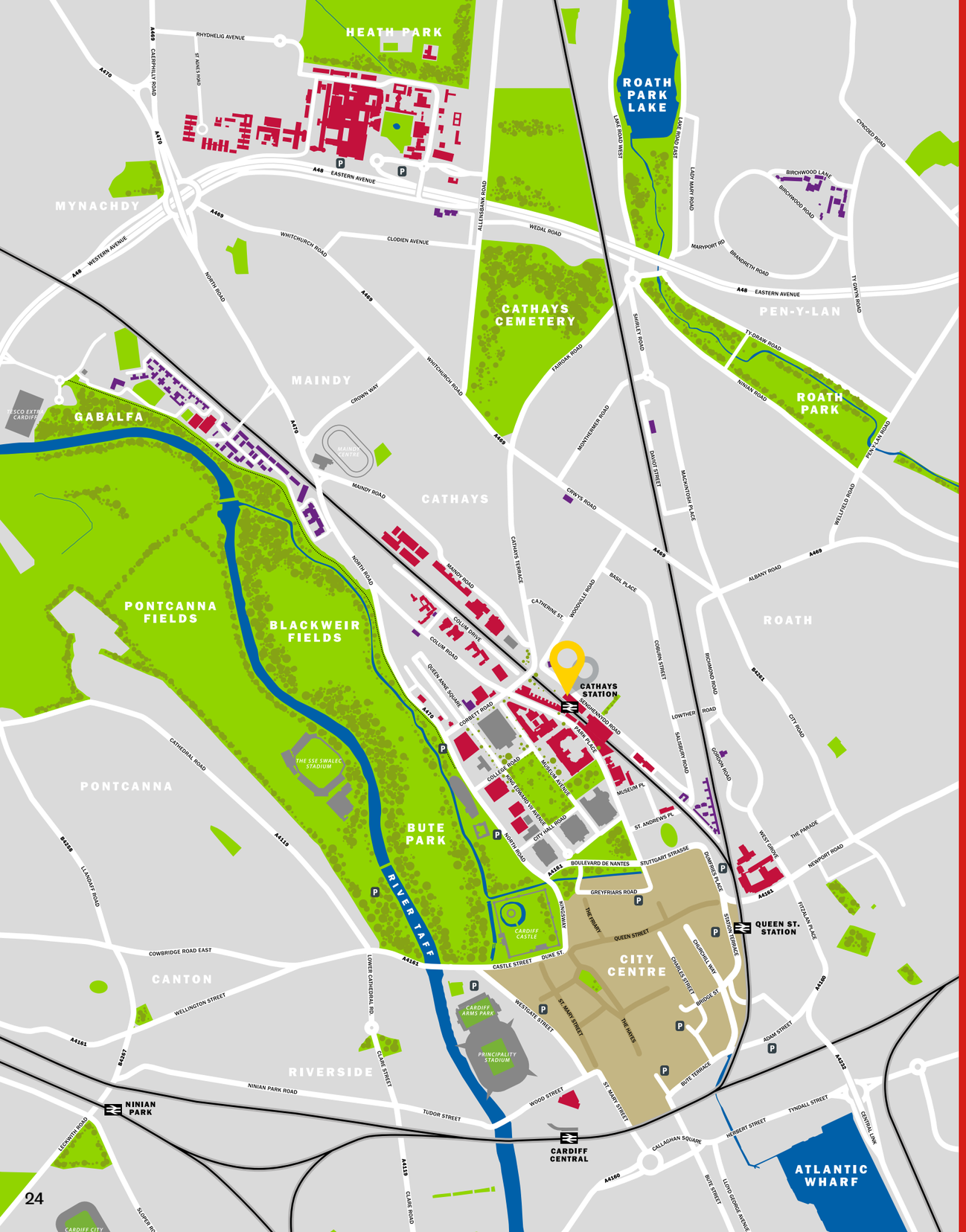
Typical A-level Offer:
AAB - BBB (must include Maths)

Typical Bacc Wales Offer:
Baccalaureate Wales will usually be accepted as an equivalent to one A-level

Typical Int Bacc Offer:
34-31 or 666-665 (must include grade 6 in HL Maths).

Other:
Applications from those offering alternative qualifications are welcome. Please see detailed admissions and selection criteria for more information.

Find out more about **applying**.



How to find the School

The School of Computer Science and Informatics is located in Abacws Building, on Cathays Campus.

Key

- School of Computer Science and Informatics
- University and NHS buildings
- Student residences

Important Legal Information

The contents of this brochure relate to the Entry 2026 admissions cycle and are correct at the time of going to press in June 2025. However, there is a lengthy period of time between printing this brochure and applications being made to, and processed by us, so please check our website at: **www.cardiff.ac.uk** before making an application in case there are any changes to the course you are interested in or to other facilities and services described here. Where there is a difference between the contents of this brochure and our website, the contents of the website take precedence and represent the basis on which we intend to deliver our services to you.

Your degree:
Students admitted to Cardiff University study for a Cardiff University degree.

This brochure is printed on paper obtained from well managed sources using vegetable-based inks. Both the paper used in the production of this prospectus and the manufacturing process are FSC® certified. The printers are also accredited to ISO14001, the internationally recognised environmental standard.

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Thank you.

Mae'r ddogfen hon hefyd ar gael yn Gymraeg.

This document is also available in Welsh.

Cardiff University is a registered charity, no. 1136855

This prospectus can be made available in alternative formats, including large print (text), Braille and on audio tape/CD.

To request an alternative format please contact Laura Roberts:

Tel: **029 2087 4455**
Email: **RobertsL9@cardiff.ac.uk**

To find out more about the School of Computer Science and Informatics

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