# Computing and Mathematics

## School and College Outreach Offer 25/26

Sheffield Hallam University

Visit our outreach website for more information

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# Explore Our Outreach Opportunities

**Discover the outreach activities we provide, tailored to support students in making informed decisions about university-level study**

We deliver interactive, hands-on masterclasses in Computing and Mathematics, aimed at deepening students' knowledge and understanding while offering a glimpse into academic pathways and university experiences. These sessions can be tailored into full taster days and are complemented by a general course talk outlining the different routes available within the discipline.

Each masterclass lasts between 45-75 minutes and can be hosted either on campus or at your location, and are ideal for KS5 students. If you're working with KS3 or KS4 students, please get in touch to discuss the opportunities we can offer.

In addition, we often run bespoke events with external companies/charities, as well as themed days aligned to national events. Interested in finding out more? Sign up to our monthly mailing list and visit our events webpage by following the QR code below.

**To book, enquire or sign up to our mailing list, please contact the team at sclo@shu.ac.uk**
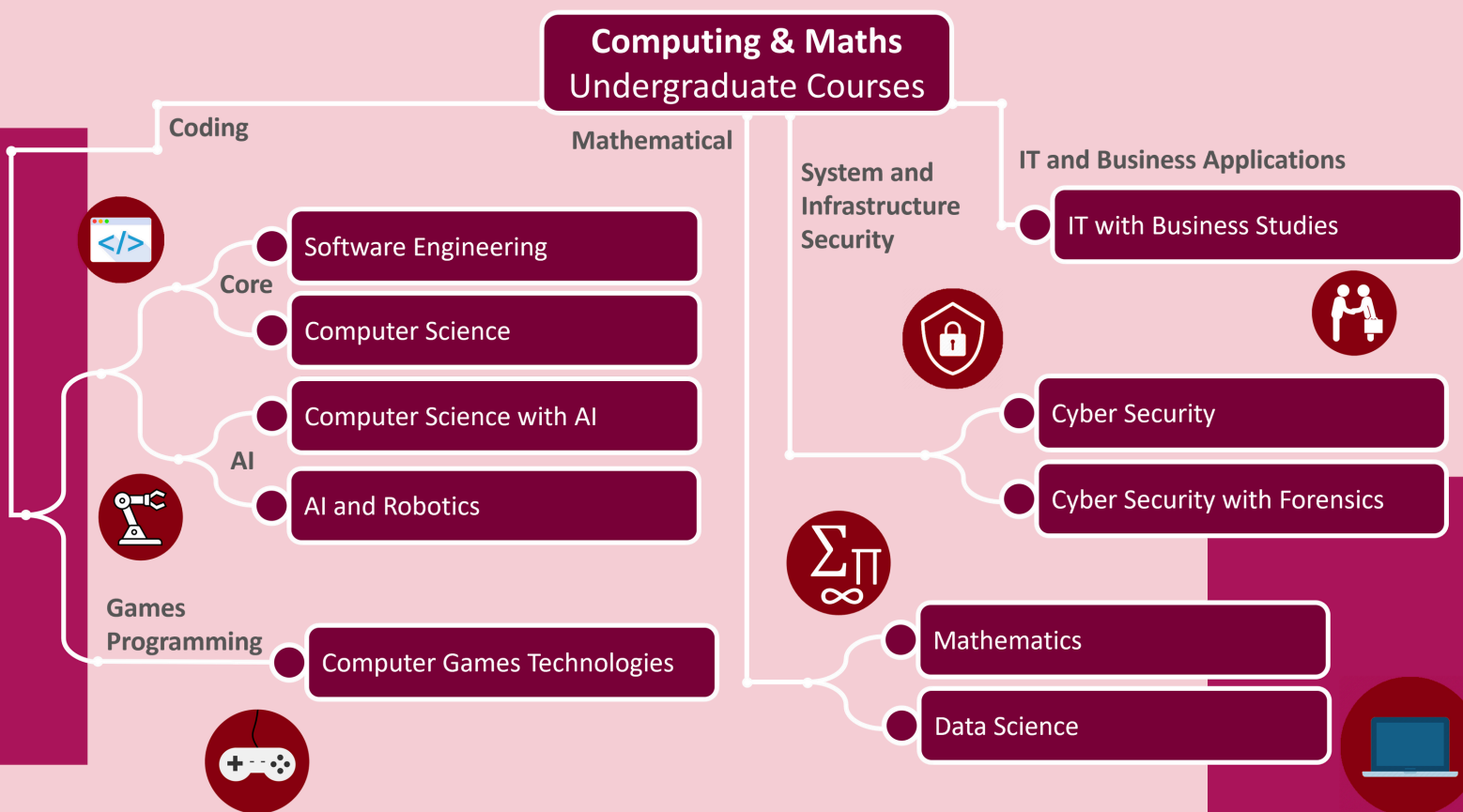
## Masterclass Topics

- AI and Robotics
- Computer Games Programming
- Computer Science and Software Engineering
- Cyber Security and Digital Forensics
- Data Science
- IT and Business
- Mathematics

# Pathways in Computing and Mathematics

This engaging talk highlights the vital role computing and mathematics play in our everyday lives and explores how these disciplines underpin a wide range of high-level careers. It introduces the various university courses available and explains how they connect to emerging opportunities in the context of the digital revolution. The session can be delivered as a standalone talk or combined with the other masterclass activities outlined below to create a more immersive experience.

**Computing & Maths**
Undergraduate Courses

Coding

Mathematical

System and Infrastructure Security

IT and Business Applications

IT with Business Studies

Core

Software Engineering

Computer Science

Computer Science with AI

AI

AI and Robotics

Cyber Security

Cyber Security with Forensics

Games Programming

Computer Games Technologies

Mathematics

Data Science

# AI and Robotics

Robotics and automation are becoming central to industries and everyday life, from manufacturing and logistics to healthcare and personal devices. These systems are increasingly powered by artificial intelligence, allowing machines to make decisions, adapt to changing conditions, and perform complex tasks. A key challenge is bridging the gap between logical computer code and the messy, unpredictable real world of sensors, signals, and data. AI and Robotics sits at this intersection, combining software and hardware to create smarter, safer, and more efficient robotic systems. Students in this area learn how algorithms, electronics, and engineering come together to push the boundaries of autonomous technology.

# Computer Games Programming

Games are one of the most exciting and fast-moving areas of computing. Beyond entertainment, they represent a major global industry, driving innovation in graphics, interactivity, and real-time processing. Developing a game requires a unique blend of creativity and technical skill, bringing together teams of coders, artists, musicians, designers, and testers. Computer Games Programming focuses on the code that powers these worlds — from the physics of movement to the logic of gameplay. Students learn how programming languages, game engines, and problem-solving techniques come together to build everything on screen.

# Computer Science and Software Engineering

Software development / programming / coding lies at the heart of our digital infrastructure – practically everything interacts with software, from traffic lights to smart phones and devices, to websites, to the operating systems of our computers. Someone needs to write that software, and that is the job of Computer Scientists and Software Engineers. Artificial Intelligence solutions are themselves software solutions that are being deployed in ever increasing areas. This area trains the next generation of programmers and AI engineers.

# Cyber Security and Digital Forensics

Computers contain a lot of information about us, and they are more connected than ever before. For all the good those systems do to improve our everyday life, there are bad-actors that want to take advantage for their own personal gain. This field looks at how we can protect ourselves from cyber-attacks and keep our infrastructure safe from a whole infrastructure perspective. Forensics are important to understand emerging attack vectors to aid defence against them, while also preparing evidence for law enforcement agencies.

# Data Science

The world around us is full of data that businesses place huge value on; in our digital age, data can be seen as the new gold, where most businesses harvest and mine data for their own benefit and profit. Sometimes that data is also useful for us – live traffic updates from others using map apps, for example, is data science in action and allows us to plan our journeys. But we are talking about a lot of data… vast amounts in fact. To get meaningful value from that data, we need to understand how to manipulate it and gain those insights, and that is the domain of your Data Scientist. It is an interdisciplinary area that collides Mathematics with Computer Science, Machine Learning and Artificial Intelligence.

# IT and Business

The digital age we live in is exciting and ever evolving, but they fit within something of a defined business setting – unless a business feels it can make money from a technological marvel, it is unlikely to exist; most investment in technology comes from businesses seeing an opportunity. How can business take advantage of digital technologies to make their processes more efficient and effective, while also giving new insight into stakeholders, for example, and deliver to market goods and services that are appropriate. This area trains students to work in the hybrid world of digital transformation

# Mathematics

Maths is all around us in science, nature and art, and touches all areas of our lives. Mathematical models allow us to describe and understand different processes, whether these are physical infrastructure such as how to safely build bridges, social phenomena such as how queues form, or biological processes such as how cells work. Logical reasoning and problem solving skills enable mathematicians to understand these processes and many others, enabling us to solve real-life challenges and continue to push our core understanding. Maths has been part of the human story throughout time in many different cultures, and continues to be fantastically relevant today as always.

# Example Taster Day

Mix and match to create a taster day bespoke to your student's needs.

| Timings | Session |
|---------|---------|
| 09:45 ... 14:15 | Arrival & Welcome |
| | Computing and Mathematics Pathways Talk |
| | Group Session 1 |
| | Campus Or Facilities Tour |
| | Lunch |
| | Group Session 2 |
| | Feedback & Close |

This is a sample programme for a full on-campus taster day focused on Computing and Mathematics. We can also accommodate half-day sessions, later starts for students travelling from further away, or carousel-style activities for larger groups, depending on room availability and academic staffing.

If you're unable to visit us, we're happy to bring our interactive taster sessions to your school or college.

**Please don't hesitate to get in touch to discuss your specific requirements. we're here to help tailor the experience to your needs.**

# Advice & Transition Outreach Activities

Supplement your subject specific sessions with general HE activities.

## Activities

For Y12, Y13 and mature students, can be delivered on or off campus.

**Beyond the Classroom:** Your journey ahead explore higher education and plan your next steps.

**Building your Brand:** Build skills for strong university and degree apprenticeship applications.

**Own Your Budget:** A session on student finance, university costs and budgeting.

**Student Life in Sheffield:** An insight into life at Hallam and student opportunities in Sheffield.

# Teacher & Adviser Opportunities

Become part of our community and schedule a meeting to discover how you and your students can engage with our offer.

## Learn With Us!

We offer Continuing Professional Development (CPD) sessions for teachers and advisors, designed to support your growth and keep your knowledge up to date.

Can't see what you're looking for, or would like support in another way? Just get in touch- **sclo@shu.ac.uk**

- ✓ Intro to cloud computing
- ✓ Coding / Programming Refresher
- ✓ Embedding sustainability into teaching
- ✓ Why take maths beyond A Level
- ✓ Cyber Security Demystified

# Access Hallam

**Helping students progress with confidence.**

**Our Access team is here to help your students feel excited about the opportunities that Sheffield Hallam can offer them.** We'll show them what's possible and what happens next. Because we want to make sure that nothing holds them back from succeeding.

All our support is delivered through a range of programmes. Based on evidence and input from our students and their supporters, we design the programmes to address the diverse challenges people can face and give the support that individuals need.

## Hallam Progress

Hallam Progress provides support for applicants whose personal circumstances might mean that there are barriers to going to university. By joining Hallam Progress, students will have help to guide them through the application process and get them ready to start learning at university. More information can be found at **shu.ac.uk/progress**

## Black British Pathway Programme

This specialist programme has been designed by current Black British students studying at Hallam alongside Access team staff to ensure that future students and applicants feel welcome here and have the best possible start. With bespoke visits and tailored support we aim for participants to feel part of the community before even enrolling.

**For more information, contact us at access@shu.ac.uk or 0114 225 4777.**