How Computer Sciences supports a career

The term ‘computer science’ is variously defined as ‘the study of computer hardware and software design’, ‘the study of computers and computing, including their theoretical and algorithmic foundations, hardware and software, and their uses for processing information’ and ‘the study of computers and how they can be used ’. It is therefore quite wide-ranging and one computer science degree is not, in terms of study, the same as another.

IT versus Computer Science

It is important to differentiate between what we might call ‘IT’ and computer science. The former is considered to be the practical profession of building and maintaining real-world systems whereas the latter is considered to be the academic study of computing and research into new ideas.

How cyber security fits in

We also need to consider the term ‘cyber security’. Whilst cyber security clearly has a direct relationship with computer science, they are not exactly the same thing and many computer science degrees do not teach cyber security as part of the course. There are separate cyber security degrees and, like computer science, what is taught depends on where the learner goes. It is certainly possible to enter the cyber security job market with a first degree in computer science, with further training.

Looking a selection of prospectuses from a few UK universities, this is what is taught, as a sample, to undergraduates:

Programming and software engineering. These topics cover programming fundamentals, data types, how a computer handles memory and CPU processing, and the software development lifecycle.

Computer architecture. This includes binary operations, the design of logic gates, memory hierarchies, assembly language and use of compilers and debuggers.

Database and web design.

Maths for computer scientists (note many universities require Maths A level). Statistics, algebra, analysis, graph theory, group theory.

Data-driven computer science. Data processing tasks, feature extraction, modelling, machine learning models and data classification.

Interaction between humans and computers. Interface design and the impact of computing on society.

Artificial Intelligence.

Cryptography.

A financially secure future

Computer science graduates can command some of the highest entry level salaries after graduation. According to the Complete University Guide, computer science degrees command the second highest starting salaries (after Dentistry but ahead of Medicine; those disciplines usually result in much higher salaries later in the career).

Get learners started early

The world of computer sciences and cyber security is full of opportunities and fruitful career prospects. There are many ways you can inspire learners from a young age and develop their interest in the fields. Learning tools like CyberSprinters, Cyber Explorers, CyberFirst Navigators and Teach the Nation to Code are all useful resources for young learners and the best part is that they're all free!