IGCSE Computer Science

Why study this subject?

Learners following the Cambridge IGCSE Computer Science syllabus develop their understanding of the main principles of problem-solving by creating computer-based solutions using algorithms and high-level programming language, applying their understanding. Learners also develop a range of technical skills, as well as being able to effectively test and evaluate computing solutions. Studying Cambridge IGCSE Computer Science will help learners appreciate current and emerging computing technologies, the benefits of their use and recognize their potential risks.

Aims of this subject:

IGCSE Computer Science helps learners develop an interest in computing and gain confidence in computational thinking. It is an ideal foundation for further study at Cambridge International AS and A Level, and the skills learnt can also be used in other areas of study and in everyday life.

Assessment at a glance:

PAPER 1 Theory: Computer Systems

This written paper contains short-answer and structured questions. All questions are compulsory.

No calculators are permitted in this paper - 75 marks. Externally assessed.

Duration: 1 hour and 45 minutes

Weighting: 50%

PAPER 2 Algorithms, Programming and Logic:

This written paper contains short-answer and structured questions and a scenario-based question. All questions are compulsory.

No calculators are permitted in this paper - 75 marks. Externally assessed.

Duration: 1 hour and 45 minutes

Weighting: 50%

Curriculum content:

Paper 1 – Computer Systems	
Data Representation	• **Binary Systems** • **Hexadecimal** • **Data storage**
Communication and Internet technologies	• **Data transmission** • **Security aspects** • **Internet principals of operation**
Hardware and Software	• **Data Storage** • **Computer architecture and the fetch-execute cycle** • **Input devices** • **Output devices** • **Memory, storage devices and media** • **Operating systems** • **High- and low-level languages and their translators** • **Network Hardware**
The internet and its uses	• **The internet and the world wide web** • **Digital currency** • **Cyber security**
Automated and emerging technologies	• **Automated systems** • **Robotics** • **Artificial intelligence**
Paper 2 – Algorithms, Programming and Logic	
Algorithm design and problem solving	Problem-solving and design Pseudocode and flowcharts
Programming	Programming concepts: sequence, selection and iteration, mathematical operators, functions & procedures Data structures: arrays, file Handling
Databases	
Boolean Logic	

Future employment prospects:

"Computing is one of those fields where it is almost impossible to predict what will happen next. This is why we cannot even begin to imagine all the ways that you can make a contribution to it and it can make your life's work exciting and real." – Association of Computing Machinery

What kinds of careers are open to me with a degree in Computer Science?

Many people incorrectly believe that a computer science career is all about programming. While it is true that most entry-level jobs after a Bachelor's degree involve programming, most practitioners eventually graduate to other responsibilities such as design, coordination, testing, planning and management. Thus, you typically start with a software engineering job after a Bachelor's and move on (after about 5 years of experience) into higher-level positions. With advanced coursework and a Master's degree, you can work in an area of specialization that uses your advanced coursework. For example, working for an animation outfit such as Disney will require at least 2 to 3 courses in computer graphics. Finally, a PhD degree usually finds its recipient in a research environment such as a research lab, research wing of a large corporation or a university.

Are there careers in Computer Science that involve people-skills, or will I be staring at a screen all day?

Most career paths in computer science involve people skills and interacting with people. Beyond an entry-level position as a software engineer, almost any corporate position requires working with people. The creation of software is most often a team effort, and software companies are organizations of people like any other type of company. Thus, if your career path is typical, you will not be alone in your cubicle staring at the screen.

What if I like programming all day?

There is of course a rich tradition of computer scientists who love developing software and who are happy spending most of their time in programming or designing software. Some are so motivated that they often spend hours on programming beyond their time at work. Many of these efforts have resulted in the vast amount of free open-source software available on Linux and other systems.