

Subject Guide:

A Level Computer Science

Change to all A Levels

Changes are under way for all A levels in all schools and colleges and some awarding bodies are still revising their syllabuses for 2015. As a result, this guide is an illustration of the content but the exact details may change.

The most significant changes in A Levels and AS exams (but see below for the different timescale in this subject) are:

- All assessment for A Levels will be through end of course exams with no practical element in most subjects.
- There will still be AS as one year “half A Levels” but you won’t be able to add an A2 to make them into a full A Level.
- This means if you want a full A Level you will need to decide that at the start of your course.
- You will still be able to combine A Levels with other types of qualifications such as BTECs.
- These changes are happening at different times for different subjects.
- You’ll have lots of support from us before you have to make your final choice of subjects.

Specifics for this subject:

The first teaching for the new examinations is in September 2015 leading to an end of course exam in 2017.



What is Computer Science?

Computer Science combines the theory and practice of computing to enable you to prepare for a wide range of roles involving computers and digital technology. The subject has been developed specifically to meet the needs of employers across a wide range of industries. It features:

- computer systems (hardware, software and computer languages);
- algorithms and programming; and
- a large computing project that you choose.

Computer Science prepares you to progress into careers as a computer specialist by linking to a wide range of applications of computers in the modern world. The new Computer Science syllabus is heavily practical, allowing you to combine programming and computational thinking skills to solve problems, design systems and harness technology.

Moving on from traditional “ICT” in schools, the new A Level combines understanding of computerised systems, programming and computational thinking with the major practical programming project. You’ll need a logical mind and to be comfortable with mathematical problem solving.

What GCSEs do I need to study Computer Science?

It is now possible to study Computer Science at GCSE although many schools still offer ICT which mainly deals with the important, but limited, applications of software. Previous study of ICT will be very useful but so will any work you’ve done at home programming, problem solving and developing systems. We would normally advise you to have at least a B Grade in GCSE Mathematics because of the mathematical logic within programming.



What could I do with it afterwards?

Computer Science skills are required by almost every industry you could imagine and there is great demand for young people who can programme, develop secure data systems and networks and apply web technologies. Locally there is particular demand for young people with cyber security skills and there are growing national opportunities in areas such as gaming, interactive web development and network management.



What form does the assessment take?

Computer Science is one of the subjects that has retained a practical element, with written papers in computer systems and programming/ algorithms supplemented by a major project worth around 20% of the marks. The exams will be a mixture of short and extended response questions.

Course details

Computer Systems

- Software and its development.
- Types of programming language.
- Data types, representation and structure.
- Data exchanges and web technologies.
- Following algorithms.
- Boolean algebra (modelling true and false).
- Legal, moral and ethical context of computing.

Computational Thinking

- Building blocks of computational thinking.
- Programming and problem solving.
- Pattern recognition, abstraction and decomposition (problem segmentation).
- Algorithm design and efficiency.
- Standard algorithms.

Programming Project

- This will involve a complex programming project agreed with the UTC that allows you to demonstrate that you have advanced programming skills and knowledge.
- Where possible we will try to link this to an actual need for one of our employer partners.
- The programming project does not have to be in any specific programming language.