Computer science

Course content

Computer Science has computational thinking at its core; thinking that provides solutions to problems, designs systems and recognises the nature of human and machine intelligence.

It is a creative subject that involves the innovative thinking and development of ideas through coding.

You will learn to become a strong programmer using different programming paradigms. As part of this, you will explore many of the standard algorithms used in searching, sorting and pathfinding and will be able to select the most appropriate to use, based on its efficiency and suitability for the problem at hand. A diverse range of theoretical topics are covered, including how computers use logic, number systems, networks, databases and more.

Computer science is split into papers one, two and non–examined assessment (NEA). Students will study a range of topics over the two years of A-level.

The following topics are studied during A level computer science:

- The characteristics of contemporary processors, input, output and storage devices
- Types of software and the different methodologies used to develop software
- Data exchange between different systems
- Data types, data structures and algorithms
- Legal, moral, cultural and ethical issues
- Elements of computational thinking
- Problem-solving and programming
- Algorithms to solve problems and standard algorithms

Entry requirements

Grade 6 in GCSE Computer Science or Grade 6 in GCSE Maths

Assessment

1. **Computer systems** – 2 hours and 30 minutes (written paper) – 140 marks - 40% of A-level
2. **Algorithms and programming** – 2 hours and 30 minutes (written paper) – 140 marks - 40% of A - level
3. **Programming project** – NEA component – 70 marks – 20% of A – level

Progression

University progression. Students progress to Russell Group universities or take up apprenticeships with leading companies to become programmers, computer engineers, big data analysts, computer game designers or specialists in the telecommunications industry.

Employment progression. Future careers include: computer science, software development, IT support, cyber security, web development, computer programming