A LEVEL

Computer Science

Computer Science is a practical subject where students apply the academic principles learned in the classroom to real-world systems. It's a creative subject that combines invention and excitement that can look at the natural world through a digital prism.

The course aims to enable learners to develop an understanding of and ability to apply the fundamental principles and concepts of Computer Science. It will give students the opportunity to learn computational thinking, helping develop the skills to solve problems, design systems and understand the power and limits of human and machine intelligence.
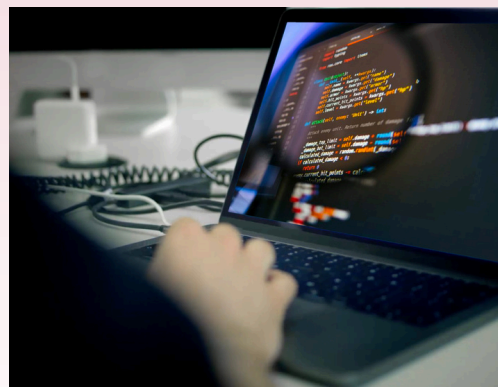
COURSE CONTENT

The qualification will focus on programming and emphasise the importance of computational thinking as a discipline. It will also have an expanded focus on maths, much of which will be embedded within the course.

The course is structured around the following topics:

Computer Systems
• Characteristics of contemporary processors
• Software and its development
• Types of Programming Languages
• Data Types, Representation and Structures
• Exchanging Data and Web Technologies
• Following Algorithms
• Using Boolean Algebra
• Legal, Moral and Ethical Issues.

Algorithms & Programming
• Elements of Computational Thinking
• Programming and Problem Solving
• Pattern Recognition, Abstraction and Decomposition
• Algorithm Design and Efficiency and Standard Algorithms

Programming Project
The learner will, with the guidance of a teacher, select their own user-driven problem of an appropriate size and complexity to solve. This will demonstrate the skills and knowledge necessary to meet the Assessment Objectives. Students will need to analyse the problem, design and implement the solution and give a thorough evaluation.

SKILLS REQUIRED

To study A Level Computer Science, students must have taken GCSE Computer Science. They should demonstrate strong logical and problem-solving skills, a good grasp of mathematics, programming proficiency, and the ability to think analytically, creatively, and critically. Traditionally, Computer Science is combined with Mathematics or the Sciences, though this is not essential. The transferable skills developed across these subjects are highly valuable, with problem-solving and critical thinking proving vital when tackling complex algorithms.

ASSESSMENT

All course content is examined at the end of the two-year course. The assessment consists of three components, two of which are externally marked question papers and the other a coursework project which has an emphasis on coding and programming.

Paper 1:
Computer Systems. 2 hours 30 minutes. 40% of final marks.
Paper 2:
Algorithms and Programming. 2 hours 30 minutes. 40% of final marks.
Coursework:
Programming Project. 20% of final marks.

ENRICHMENT

We offer a number of enrichment opportunities including clubs, competitions and International trips.

FUTURE PATHWAYS

Based on results students apply for a wide range of Computer Science / Software Engineering related disciplines at university or take an apprenticeship route to gain experience and qualifications as a software engineer/developer.

EXAM BOARD
OCR H446

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