

# COMPUTER SCIENCE

EXAM BOARD: OCR

## Why study Computer Science?

Computer Science is a practical subject where learners can apply the academic principles learned in the classroom to real world systems.

**It is an intensely creative subject that combines invention and excitement, and can look at the natural world through a digital prism.**



An A- Level in Computer Science values computational thinking, helping learners to develop the skills to solve problems, design systems and understand the power and limits of human and machine intelligence.

Learners will develop an ability to analyse, critically evaluate and make decisions. The project approach is a vital component of 'post-school' life and is of particular relevance to Further Education, Higher Education and the workplace. Each learner is able to tailor their project to fit their individual needs, choices and aspirations. A rigorous assessment structure ensures the integrity of the project

## Aims & Learning Outcomes:

The aims of this qualification are to enable learners to develop:

- an understanding of and ability to apply the fundamental principles and concepts of computer science including; abstraction, decomposition, logic, algorithms and data representation
- the ability to analyse problems in computational terms through practical experience of solving such problems including writing programs to do so
- the capacity for thinking creatively, innovatively, analytically, logically and critically
- the capacity to see relationships between different aspects of computer science
- mathematical skills
- the ability to articulate the individual (moral), social (ethical), legal and cultural opportunities and risks of digital technology

## Content Overview:

- The characteristics of contemporary processors, input, output and storage devices
- Software and software development
- Exchanging data
- 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

The learner will choose a computing problem to work through:

- Analysis of the problem
- Design of the solution
- Developing the solution
- Evaluation

## Assessment overview:

Learners must take 3 components; 1, 2 & 3 or 1, 2 & 4			
(1) Computer Systems	(2) Algorithms & Programming	(3) Programming Project	(4) Programming Project
2hrs 30 mins written, 40%	2hrs 30 mins written, 40%	Moderated upload, non-exam, 20%	Moderated postal, non-exam, 20%

## Progression Pathways:

Developing software and hardware that solves key problems is crucial to a vast range of careers, from personalised medicine to the entertainment industry. Computing personnel are required by industries as diverse as space and aeronautics, national defence, sports equipment, transport and travel, modern media and social networking. As well as leading to degrees and apprenticeships in computer science, software engineering, cyber security, artificial intelligence and robotics, A-level computer science helps you develop the skills needed to analyse big data, leading to careers in banking, stock broking and finance.