



A Level

# 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.

OCR's A Level in Computer Science will value computational thinking, helping learners to develop the skills to solve problems, design systems and understand the power and limits of human and machine intelligence.

## What Will I Learn on This Course?

### Computer systems (Component 01)

#### Topic list:

This component will introduce learners to the internal workings of the Central Processing Unit (CPU), the exchange of data and will also look at software development, data types and legal and ethical issues. It is expected that learners will draw on this underpinning content when studying computational thinking, developing programming techniques and devising their own programming approach in the Programming project component.

#### Assessment:

2 hours and 30 minutes written paper (140 marks, 40% of total A Level)

### Algorithms and programming (Component 02)

#### Topic list:

This component will incorporate and build on the knowledge and understanding gained in the Computer systems component (01). In addition, you should be able to understand what is meant by computational thinking and the benefits of applying computational thinking to solving a wide variety of problems, as well as understanding the principles of solving problems by computational methods, using algorithms to describe problems and analysing a problem by identifying its component parts.

#### Assessment:

2 hours and 30 minutes written paper (140 marks, 40% of total A Level)

### Non-exam assessment Programming project (Component 03 or 04)

#### Topic list:

Learners will be expected to analyse, design, develop, test, evaluate and document a program written in a suitable programming language. The underlying approach to the project is to apply the principles of computational thinking to a practical coding problem. Learners are expected to apply appropriate principles from an agile development approach to the project development. While the project assessment criteria are organised into specific categories, it is anticipated the final report will document the agile development process and elements for each of the assessment categories will appear throughout the report.

#### Assessment:

Non-exam assessment – centre marked and moderated by OCR (70 marks)

## Why study Computer Science?

The most important aspect of computer science is problem solving, an essential skill for life. Students study the design, development and analysis of software and hardware used to solve problems in a variety of business, scientific and social contexts. Because computers solve problems to serve people, there is a significant human side to computer science as well.

## Where Will an A Level in Computer Science Lead Me?

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 person is able to tailor their project to fit their individual needs, choices and aspirations.

Having a computing degree will provide you with the knowledge, problem-solving skills and logical thinking capabilities that serve as a competitive advantage in your career. You can also use your knowledge and skills to launch scientific innovation; the human genome project, viral research and environmental protection are three areas boosted by Computer Science. Every industry uses computers, meaning computer scientists can pursue any sector they want.