COLFE'S SCHOOL

Computer Science

We live in a digital world, and a Computer Science A-Level will equip you with the theoretical knowledge and practical skills necessary to progress to further study and have a successful career in technology. The digital sector has an enormous variety of well-paid job roles to offer. Possible careers include programming, computer architecture, cyber-security, cloud computing or AI. There is a huge skills shortage, so an A-Level in Computer Science will give you excellent career prospects.

The OCR A-Level in Computer Science combines three units. In unit 1, you will learn about computer systems. This includes the internal workings of the CPU, data exchange, software development, data types and ethical issues.

Unit 2 is algorithms and programming. Students learn how to interpret and write algorithms for a range of scenarios. They also learn how to program in Python, using object-oriented programming techniques and various libraries.

Alongside unit 1 and 2, students will also complete a programming project which is 20% of the overall grade. Students are expected to analyse a problem, and design, develop, test, evaluate and document a program to solve the problem. The program can be written in Python, or another programming language of their choice.

Many students choose to study Mathematics alongside the Computer Science A-Level. This is not a requirement, but it is worth noting that many universities require a Mathematics A-Level to be accepted onto Computer Science degrees.

We encourage our students to develop their programming skills as much as possible and we enter them into international computational thinking competitions such as BEBRAS.

Exam board: OCR

Component 01: Computer systems. 40%

- 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.

Component 02: Algorithms and programming 40%

- What is meant by computational thinking (thinking abstractly, thinking ahead, thinking procedurally etc.)
- Problem solving and programming – how computers and programs can be used to solve problems
- Algorithms and how they can be used to describe and solve problems.

Component 03: Programming project 20%

Students are expected to apply the principles of computational thinking to a practical coding programming project. They will analyse, design, develop, test, evaluate and document a program written in a suitable programming language. The project is designed to be independently chosen by the student and provides them with the flexibility to investigate projects within the diverse field of computer science.