Statement of Intent – KS5 Computer Science

"Sometimes it is the people no one can imagine anything of who do the things no one can imagine." Alan Turing

OCR A-Level Computer Science is a Sixth Form option available for current Year 13 students and future Year 12 students. There are no Year 12 students studying the subject in 2021-22.

We align to the school vision of '*Living well together with dignity, faith and hope.'* Students are taught to live well together by exploring cyber security issues, exploring laws and ethics behind Computer Science. Students are afforded dignity by the provision of a laptop free of charge. Students demonstrate faith as they develop their A-Level projects, overcoming syntax and logical errors to develop a fully functional programme.

SEND students are supported in understanding abstract concepts through visual demonstrations. For example, when teaching the properties of a CPU, teachers ask students to act out physical instructions using different timings to ensure students grasp the concept of 1 Hertz being 'one instruction per second'. Teachers provide students with support structures using pink pen in their books to demonstrate the personalised support available to students.

Pupil Premium students are provided with a free laptop to ensure that they do not fall behind their peers academically through lack of resources. These are used in Computer Science lessons and across the school for homework and to allow students to review taught content when completing tasks.

High Attaining students are challenged to merge multiple concepts together (e.g. selection and iteration in programming). Extended project work is available for students to achieve higher levels of work (e.g. the creation of a game).

Year 13

Substantive Knowledge

Students will cover each specification area for A-Level Computer Science:
1.1 The characteristics of contemporary processors, input, output and storage devices.
1.2 Software and software development
1.3 Exchanging data
1.4 Data types, data structures and algorithms
1.5 Legal, moral, cultural and ethical issues
2.1 Elements of computational thinking
2.2 Problem solving and programming
2.3 Algorithms

Disciplinary Knowledge

Students will focus on the algorithmic and programming skills required for Paper 2 and to complete the Programming Project. Students will learn Object Orientated Programming (OOP) and have the option to learn PyGame, depending on the nature of their project. They will also learn how to use Assembly Language using the Little Man Computer (LMC) instruction set.

Students will be able to apply the key algorithms of Computer Science. They will be able to trace the searching and sorting algorithms, evaluating these based on Big O Notation.

Students will apply their programming skills through their Programming Project. This is an independently set piece of work focused on analysing a problem before designing, creating, testing and evaluating a programme.