COMPUTER SCIENCE

The Course

We offer OCR A Level Computer Science that consists of the following components:

Component 1: Computer Systems - 40%

Component 2: Algorithms and Programming - 40%

Component 3: Programming Project - 20%

A Level Computer science is split into two complementary sections, programming and theory, which are assessed across the three components above. On the programming side of the course, students can learn a programming language (chosen by your teachers from C#, Java, Pascal/Delphi, Python and VB.Net). You will cover the fundamentals of programming, data structures, algorithms, and object-orientated programme design.

The theory side of computer science teaches about the internal workings of a computer, right down to the basics of how all data is stored using binary, whether that data consists of numbers, text, pictures or even music. It goes on from there to cover aspects of computer architecture, showing exactly how data is accessed from main memory using assembly language instructions and the fetch-execute cycle. As well as covering programming the course aims to promote good programming practices such as avoiding global sensible variable naming, structured programming, good re-use of code through procedures and functions, and proper commenting of code. It also covers higher level concepts such as the social and legal impact of computers, and how to go about breaking down a big problem into individual programmable steps.

Computer Systems
- 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

Algorithms and Programming
- Elements of computational thinking
- Problem solving and programming
- Algorithms to solve problems and standard algorithms

Programming Project

- The learner will choose a computing problem to work through according to the guidance in the specification
- Analysis of the problem
- Design of the solution
- Developing the solution
- Evaluation

Why study Computer Science?

A Level Computer science is naturally a strong subject to take if you wish to go on to do computer science at degree level, and although most computing-based degree courses do not require Computer science A level there are a number of software engineering courses which do. There are also other degree courses such as information technology and information systems which will be served well by a Computer Science A Level.

After university, there are numerous interesting fields of study and professions that you can explore. Computer science will lead on to robotics, artificial intelligence, machine learning, cloud computing, big data processing, networking, ethical hacking, computer game development, home automation or even teaching. So much of the world uses computers nowadays that having a good understanding of how computers work and how to program them will set you up for success in many strands of life.

Numbers of computers are also increasing in many developing countries too, meaning that your skills in computer science will be very portable. The most popular programming languages in the world are based on the English language using statements such as for, while, if, else, repeat so studying computer science in an English speaking college will give you a good foundation if you wish to travel and find a job working with computers in another country.

What do I need to study Computer Science?

A minimum Grade 7 in GCSE Computer Science is required, and a Grade 8 is recommended. In addition, a Grade 6 in GCSE Mathematics is also required, and a Grade 7 is recommended. Computer Science uses mathematics to express its computational laws and processes and therefore a strong mathematical grade is essential.

A Level subject video available here: https://www.youtube.com/watch?v=ENSM0Ona8tw