Computer Science - A Level

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Fact File
• Two year linear A Level Course (AQA Computer Science)
• 80% Examined, 20% Coursework
• Computer Science needs computational thinkers and coders. (It is not I.T.)
• Lots of enrichment opportunities, competitions, talks and trips
• Taught in state of the art computing laboratory
• A challenging subject that is respected by both universities and employers

Course Summary
Our 21st century world is a dynamic and ever-changing place where we can now stream high definition movies to our smartphones, video chat with friends and relatives on the other side of the planet and store huge amounts of music in the cloud! We can design cars using a laptop, use voice control to browse the internet, even do our banking online at home in our pyjamas. All of these advances are made possible because of the work of computer scientists. Computers make our world possible and Computer Science is the course that will help you develop the fundamental skills and understanding required to make sense of our digital age, write your own programs & apps and perhaps imagine the technology that is yet to come!

Specific entry requirements
To ensure you have the best possible chance of success in Computer Science, you are required to have obtained at least grade 6 in GCSE Mathematics and 5 or better in GCSE English. You do not need to have any experience of programming before you start, however it would be helpful to have had a taster, just to check that you like it.

Progression skills and opportunities
The most important skill you will develop on the course is the ability to solve problems. Using mathematics and a computing language called Python you will discover how it is possible to write algorithms and computer code to create software that can perform calculations, store data and much more. Computer Science will help you develop strong logical, numerical, problem solving skills that will make you an attractive prospect for many different employers from a variety of different industries. The course could lead to a career in the Computing and IT Industry, but it could just as easily take you on a journey into Medicine, Law, Business, Politics, Engineering or any type of Science.
How is the course assessed?
The new linear A Level Computer Science course will be assessed by your performance in two exams at the end of the second year. These exams are synoptic and, between them, will cover all the elements from the entire two years of study. The first paper is an on-screen exam that will challenge your programming skills, whilst the second is paper-based. Each is 2 hours 30 minutes long and will contribute 40% to your final A level grade. The final 20% comes from your performance in an individual coursework project. This will require you to use the knowledge and skills developed during the course to research, design, program and test a piece of software that solves a practical problem of your own choosing.

What topics will I be studying?
In A level Computer Science you will discover the fundamental ideas behind computing. You will discover what really goes on inside a Computer, how data is transmitted between computers communicating over the Internet, how numbers, text, images, and sound can be stored and shared as a series of binary ones and zeros. You will learn about the logic gates inside the circuitry of a computer, how using an area of Maths called Boolean Algebra allows us to design new devices and you will study how hardware and software work together to make it all possible. The full list of topics is below:

1. Fundamentals of programming
2. Fundamentals of data structures
3. Fundamentals of algorithms
4. Theory of computation
5. Fundamentals of data representation
6. Fundamentals of computer systems
7. Fundamentals of computer organisation and architecture
8. Consequences of uses of computing
9. Fundamentals of communication and networking
10. Fundamentals of databases
11. Big Data
12. Fundamentals of functional programming
13. Systematic approach to problem solving

Will I need any specialist materials or equipment?
You will need a number of course booklets, revision guides, computing equipment and software but everything you require will be provided as you contribute towards these as part of your course costs. Your teacher may recommend other books for study and revision but it is up to you whether you buy these or access them in the College Library.