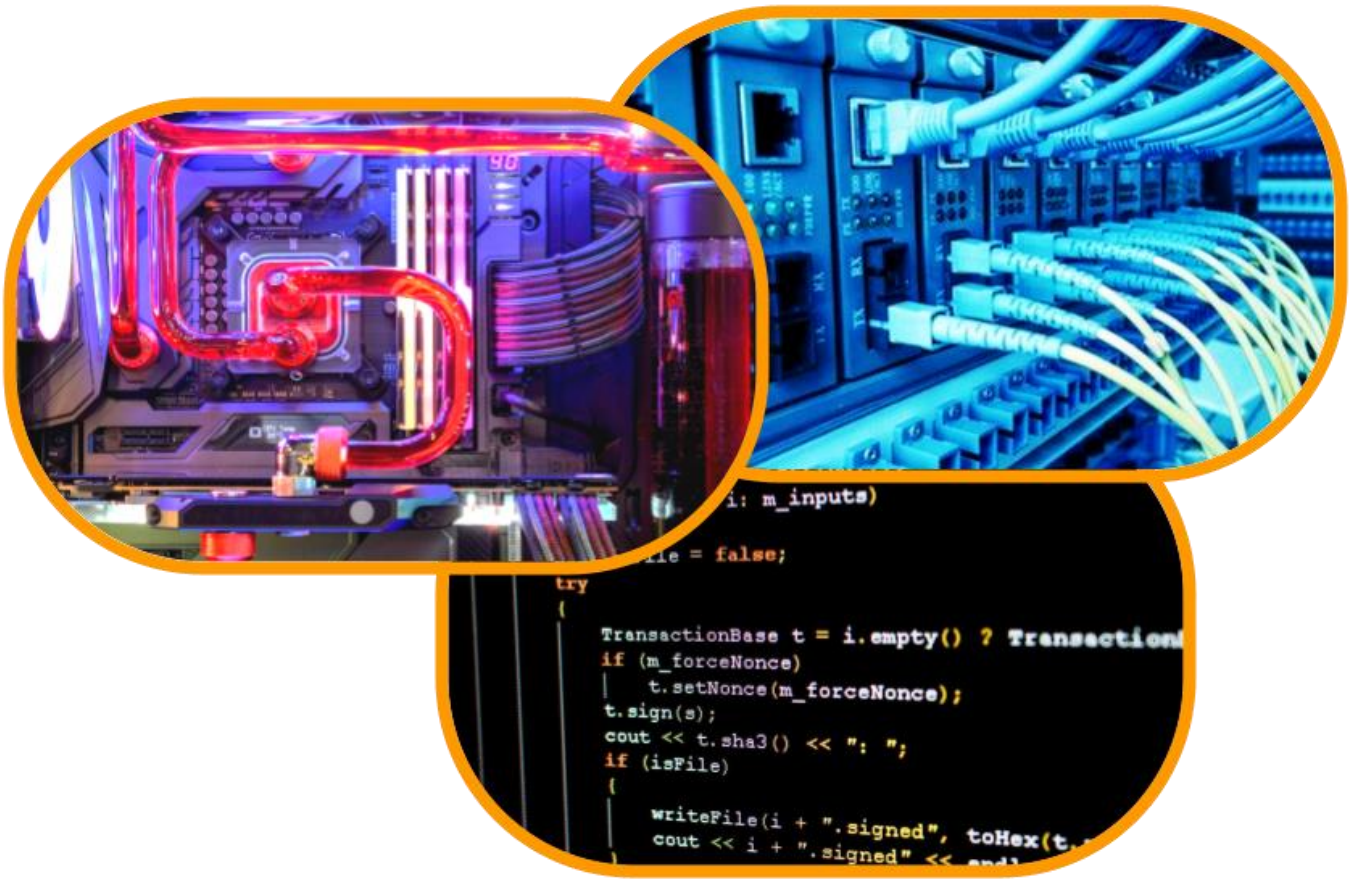
Hartismere College



Computer Science

A STUDENT'S GUIDE TO THE A LEVEL IN COMPUTER SCIENCE

What do I need to know or be able to do before taking this course?

Ideally students looking to study this subject would be achieving a grade 6 in maths or computer science, but this is not a requirement. It would be highly beneficial to have studied computer science at GCSE level but not essential. The course focuses on the study of how computers are used to solve a range of problems. You will learn about different types of computer systems, how they work and how they communicate. You will investigate the parts that make-up a computer system including software, hardware and people and develop your own computer programs through programming, mainly with the language C#. The course will also teach the importance of following a systematic methodology when creating a system to ensure it meets the requirements of the client and end-user.

What will I learn on this A level course?

The course will enable you to:

- develop your interest and enjoyment of using computer programming to solve problems
- develop as a creative, analytical and logical thinker
- develop a clear philosophy of the consequences of increased reliability on computers
- understand the importance of analysis, design, testing and evaluation when developing a system
- understand the organisation of computer systems, including software, hardware, data, communications and people

What kind of student is this course suitable for?

This course will appeal to students who:

- have an interest in developing their own software through programming
- enjoy problem solving and understanding how and why computer operate
- want to study in the area of computer science, mathematics or engineering

What examinations will I have to take to get my qualification?

The A level course consists of three units, two of which are examined while the other is coursework. We follow the OCR A level computer science specification.

Unit 1 Computer Systems
2 hour exam **40% of A Level marks**

In this unit we look in great detail at the characteristics of modern processors, the workings of input, output and storage devices and how they interact with the processor. We study a range of different systems software, the compilation process, the software development process and different types of programming languages. You will developed an understanding how data moves through computers through topics such as compression, encryption, hashing, databases, networks and web technologies. You will gain deep knowledge of the use of data types, data structures and Boolean algebra.

Unit 2 Algorithms and Programming
2 hour exam **40% of A Level marks**

This topic is all about taking real-word problems and developing code to solve these problems. The topics covered include:

- Using computational thinking to take a real-world problem and present it in a format that can be coded
- Learning a range of programming techniques for procedural and object-oriented programming as well as computational methods such as data mining and heuristics
- Developing an understanding for a range of standard algorithms, such as searching, sorting and pathing finding, and learning how to measure the efficiency of algorithms using Big O notation

Unit 3 Programming Project
Coursework 20% of A Level marks

This unit will require you to design and produce a working piece of software for a specific purpose and client of your choice. The project will follow the path of the agile development approach and will be handed in as a written report. This is a substantial project that will be presented as a report.

While working on the project, you will:

- analyse the problem;
- develop a thorough set of designs for the system;
- implement the software using an appropriate programming language (most use C#)
- fully test the system to ensure it works as expected;
- produce a detailed and thorough evaluation of the final system.

Time and work management is an important factor for this topic as it is mostly completed independently. You will be expected to work on the project outside of lesson time and complete your own research on how to solve problems.

What could I go on to do at the end of my course?

Short answer: employment, apprenticeship, degree apprenticeship, further specific training (college) or university.

Students with A level computer science have a wide range of possible career and higher education opportunities. You will learn and use a variety of transferable skills during the course. These include software and programming skills for use in the work place and personal use, the ability to create creative and innovative products using computers, the ability to problem solve, think logically and communicate effectively and an understanding of how computers operate and why. These skills are in demand from employers, universities and colleges and are also valuable in their own right.

Computer science can be studied at further education, but will also form a great basis for studying any information technology subject such as web design, artificial intelligence, games design and information systems or computational science areas such as bioinformatics. The skills used in A level computer science would also benefit those looking to study mathematics or engineering.

Many students will also use their qualification to go straight into employment or to begin an apprenticeship. In recent years, a few of our students have successfully enrolled in degree apprenticeships at organisations such as BT. A wide range of occupations are open to students with A level computer science. This can also include the opportunity to receive further training in areas such as software development, cyber security, database management, IT technician, office administration or web design and administration.

Examples of Computer Science related degree courses:

3D Modelling & Animation	Digital & Technology Solutions
Artificial Intelligence & Machine Learning	Digital Marketing
Artificial Intelligence & Robotics	Digital Media & Information Studies
Business Information Technology	Electronic & Information Engineering
Business Management & Information Systems	Electronic & Software Engineering
Cloud Computing	Electronic Music, Computing & Technology
Computer & Data Science	Games Design
Computer Forensics	Games Programming
Computer Games Technology	Information Technology
Computer Graphics, Imaging & Multimedia	Information Technology Management for Business
Computer Networks	Innovation Engineering
Computer Science	Intelligent Systems
Computer Systems Engineering	Network Engineering
Computing & Smart Devices	Software Engineering
Cyber Security	Technology, Health & Wellbeing Sciences
Cyber Security & Digital Forensics	Web Development

Contact

Mr R Sorhaindo
Assistant Headteacher
Head of Computer Science
Hartismere School
Castleton Way
Eye
Suffolk
IP23 7BL

Telephone 01379 870315
Email sixthform@hartismere.com
Website www.hartismere.com