



ABBEGATE

Sixth Form College

COMPUTER SCIENCE

Entry requirements: Minimum 5 GCSEs at Grade 4-9; minimum Grade 5 Computing or Grade 5 Mathematics and average GCSE score 5.5*

STUDENT PROFILE

This course will appeal to those students who:

- think logically and enjoy solving problems
- are inquisitive and not afraid to learn by making mistakes

PROGRESSION

In today's workplace those with knowledge and skills in Computer Science have the opportunity to pursue new and exciting careers and to be instrumental in the conception of computer systems which, increasingly, shape work and leisure activities.

Students who study A-level Computer Science will use their skills and knowledge in one of two ways:

They may choose to continue to develop their understanding of Computer Science through entry to higher education.

Alternatively, this course will provide students with necessary skills to seek employment in areas which use computing.

* Information on how to calculate your average GCSE Score can be found at www.abbeygatesfc.ac.uk/courses

STUDENT VIEW

"During the course you are taught how to code using Visual Basic. The course gives students a chance to work at their own speed, and gives plenty of opportunity for research into more advanced code during lessons"

www.abbeygatesfc.ac.uk

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COURSE CONTENT

Module 1 Computer Systems (40% of the award – written examination 2.5 hours)

This component will introduce learners to different approaches to developing computer architecture leading to the internal workings of the central processing unit and the use of registers and logic circuits to decode and execute instructions. Students will study Boolean logic and the design of logic circuits using Karnaugh maps and De Morgan's laws.

Students will study the characteristics of a number of programming approaches and the way in which they represent and manipulate data. The programming languages covered include assembly language, object-oriented language, Visual Basic, SQL and web design using HTML, CSS and Java script.

The module also covers the components, design and control of networks and the internet. It is expected that students will draw on the above when studying computational thinking, developing programming techniques and devising their own approach to the programming project.

Module 2 Algorithms and Programming (40% of the award – written examination 2.5 hours)

This component will incorporate and build on the knowledge and understanding gained in the Computer Systems module. Students will gain an understanding of the concept of computational thinking and how it can be used to resolve a wide variety of problems. The module will teach students how to analyse a problem by identifying its component parts, and to use algorithms to describe these parts.

Lessons will be a mixture of hands-on programming and time away from the computer to develop a theoretical understanding of programming constructs such as selection, iteration, recursion and heuristics.

Students will study algorithms used with the management of data, such as multiple dimensional arrays, binary trees, stacks, queues, quick sort and Dijkstra's shortest path algorithm.

Module 3 Programming Project (20% of the award – coursework based)

In this component students will program and document a substantive piece of work over an extended period of time. The component will allow students to demonstrate the skills developed by analysing and resolving a real user-driven problem.

Using an appropriate programming approach, students will create a bespoke computerised system for a real user. The project will document the investigation into the problem and the use of computational methods to design effective algorithms. It will also record students' development and testing of the final solution.