A Level Computer Science

Sixth Form study options

OXFORD
HIGH SCHOOL
G D S T

A Level Computer Science

Computer Science

This is a highly relevant, rigorous and creative A Level. Students choosing Computer Science will develop:

- An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation

- The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so

- The capacity to think creatively, innovatively, analytically, logically and critically

- The capacity to see relationships between different aspects of computer science

- Mathematical skills

Computer Science is a practical subject where students can apply the academic principles learned in the classroom to real world systems.

The key features of this qualification encourage:

- problem solving using computers

- computer programming and algorithms

- the mathematical skills used to express computational laws and processes, e.g. Boolean algebra/logic and comparison of the complexity of algorithms
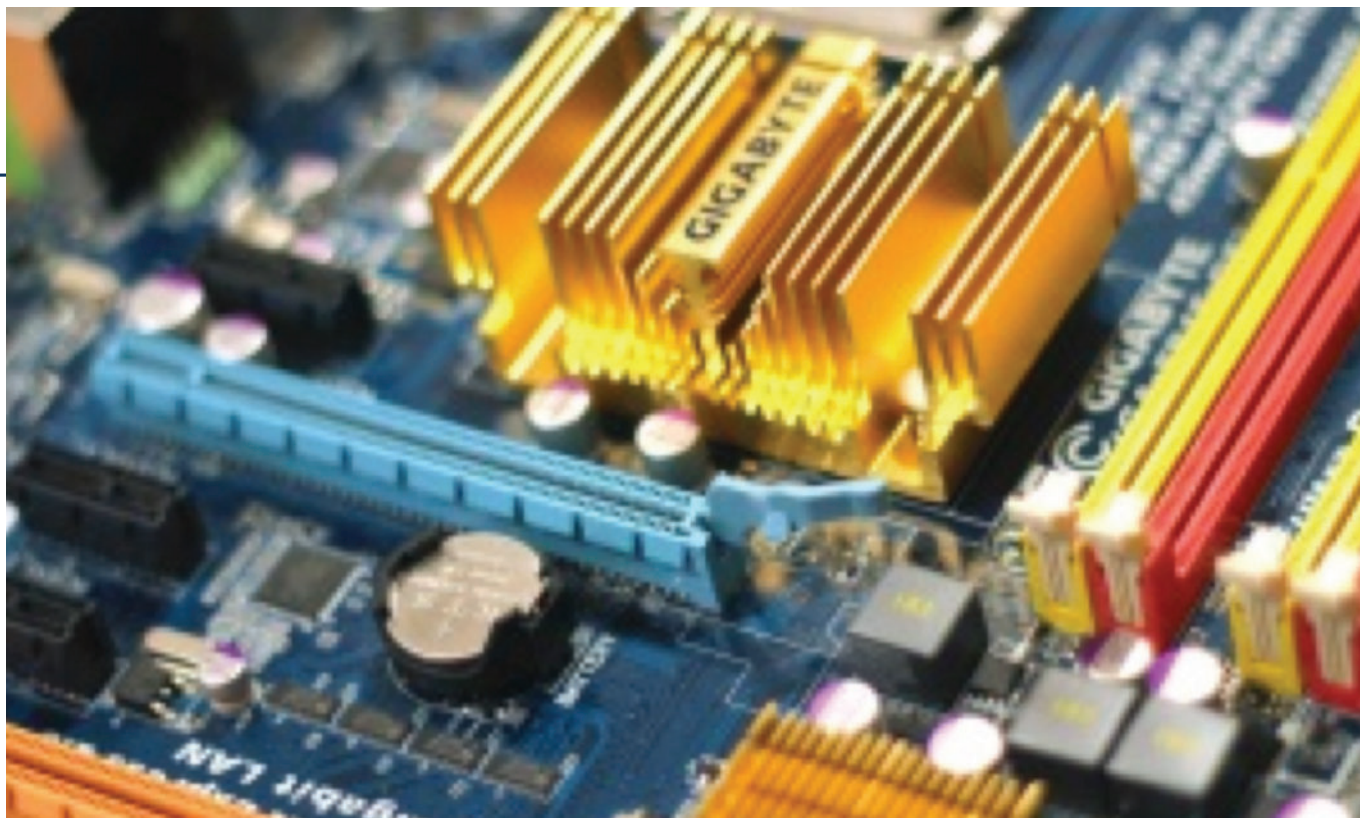
Content Overview

The course builds on much of the content covered at GCSE, and while GCSE Computing or Computer Science is not a prerequisite, those students that have studied the qualification at GCSE will start from a very strong foundation.

Content includes:

- The characteristics of contemporary processors, input, output and storage devices

- Software and software development

- Networks and exchanging data

- Data types, data structures and standard searching and sorting algorithms

- Legal, moral, cultural and ethical issues

- Problem solving and programming

A significant component of the course is the programming project, where students are required to analyse a problem of their choice, design and create a solution which is then tested and evaluated. The exam board provides a list of languages that this can be written in (Python, Java, Visual Basic, PHP, Delphi, C based language) but also states that the project should be written in a language appropriate to the solution and is willing to consider other languages. The best projects solve real problems and are often created to a near professional standard.

Assessment Overview

Computer Systems (01) contains the majority of the content of the specification and is assessed in a written paper recalling knowledge and applying understanding. (Written paper, 2 hours 30 minutes, 40% of total A Level)

Algorithms and programming (02) relates principally to the problem solving skills needed by students to apply the knowledge and understanding encountered in Paper 1. (Written paper, 2 hours 30 minutes, 40% of total A Level)

Programming project (03) is a practical portfolio-based assessment with a task that is chosen by the student (or teacher) and is produced in an appropriate programming language of the student's choice. (Non-exam assessment, 20% of total A Level)

Where does it lead to?

Computer Science sits well alongside a wide range of qualifications, in particular:

- All engineering courses
- All sciences (Biology, Biochemistry, Chemistry, Geology/Earth Sciences, Physics)
- Computer Science
- Economics
- Mathematics
- Medicine
- Pharmacy
- Psychology
- Sociology

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At its heart lies the notion of computational thinking: a mode of thought that goes well beyond software and hardware, and that provides a framework within which to reason about systems and problems.

(CAS-Computer Science, a Curriculum for Schools)