

COMPUTER SCIENCE

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We aim to offer the AQA A-level course in computer science with the subject being taught over 2 years. The course is open to anyone who has an interest in how computers actually work and how we can get them to do the things that we want. You do not need to have prior knowledge of computer science, however, study of the subject at GCSE would be advantageous. It is a valuable course if you are considering further study and/or a career in computer science. Computer science will appear within the option block lists.

Why choose computer science?

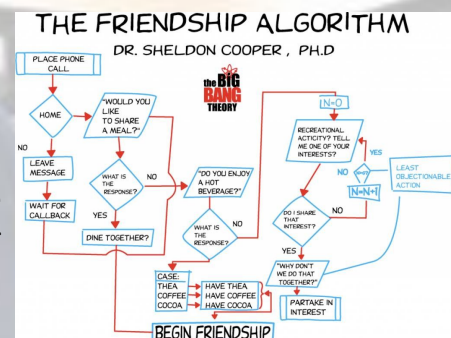
You should choose computer science if you want to:

- Know more about how computers work. It provides a sound understanding of the internal structure of computers, how they operate and their use in solving problems
- Know how computers store and process data
- Know how computers communicate with each other
- Know how to write computer programs
- Develop an understanding of the principles of computer science
- Take an opportunity to develop programming skills which would be useful to anyone intending to become a computer professional, scientist, mathematician or engineer. Many university courses like students to have had some exposure to programming

Aims

The specification aims to encourage students to develop:

- An understanding of, and the ability to apply, the fundamental principles and concepts of computer science, including abstraction, logic, decomposition, 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 for thinking creatively, innovatively, analytically, logically and critically
- The capacity to see relationships between different aspects of computer science
- mathematical skills related to:
 - Boolean algebra
 - number representations and bases
- The ability to articulate the individual (moral), social (ethical), legal and cultural opportunities and risks of digital technology



COURSE CONTENT

Paper 1:

- 📖 Fundamentals of programming
- 📖 Fundamentals of data structures
- 📖 Systematic approach to problem solving
- 📖 Theory of computation
- 📖 Systematic approach to problem solving

This paper tests a students ability to program, as well as their theoretical knowledge of computer science from the subject content above.

Preliminary material in the form of complex skeleton Pascal code is seen to help with exam preparation.

Students take an on-screen exam lasting 2½ hours and is worth 40% of the overall A-level.

Paper 2:

- 📖 Fundamentals of data representation
- 📖 Fundamentals of computer systems
- 📖 Fundamentals of computer organisation and architecture
- 📖 Consequences of uses of computing
- 📖 Fundamentals of communication and networking
- 📖 Fundamentals of databases
- 📖 Big Data
- 📖 Fundamentals of functional programming

This paper tests a students ability to answer questions about computer science from the subject content above.

Students take a written exam lasting 2½ hours and is worth 40% of the overall A-level. Questions are compulsory short-answer and extended-answer in format.

Non Examined Assessment:

The final 20% (from 75 marks) of the A-level is gained from solving or investigating a practical problem. This will involve some fairly in depth problem solving.

AS material will be taught in the first year with A-level content covered in the second year.