COMPUTER SCIENCE

Examination Board Specification: **AQA** 7517

Why Study Computer Science?

The course develops students' ability to think computationally and solve problems through programming. Students learn fundamental principles of computer science, including abstraction, decomposition, logic, algorithms and data representation, and apply these principles through practical problem-solving.
The course suits students who enjoy logical and analytical thinking, problem-solving and programming. A sound foundation in GCSE Computer Science or equivalent is recommended. The programming element of the course is primarily delivered using Python though many students choose alternative languages for their NEA.

Content

The AQA A-level provides a broad understanding of computer science, combining practical programming and problem-solving with the theory of computer systems and their wider impact. Students develop:

• The capacity to think creatively, analytically, logically and critically.
• Understanding of the principles and organisation of computer systems.
• The ability to analyse problems computationally and apply programming skills to develop solutions.
• The capacity to see relationships between different aspects of computer science.
• An understanding of the legal, ethical, cultural and social consequences of computing and emerging technologies.

Advanced Level

Paper 1 – Programming and problem-solving. This is an on-screen examination assessing students' ability to program, alongside knowledge of programming, data structures, algorithms and theory of computation. It also assesses the systematic approach to problem solving. Students answer short questions and write, adapt and extend programs using the programming language selected by the school (Python). AQA provides preliminary material and a skeleton program for use in the examination.

Paper 2 – Computing theory. This written examination assesses the theoretical content of the specification, including data representation, computer systems, computer organisation and architecture, the consequences of using computing, communication and networking, databases, Big Data and functional programming.

Non-exam assessment (NEA) – The computing practical project. Students identify or investigate a practical problem, then use a systematic approach to analyse, design, develop, test and evaluate a programmed solution or investigation. They document their work and demonstrate the technical skills used.

Content and Assessment of the Course:

A-level examinations	% of A-level
Paper 1 – Programming and problem-solving (on-screen, 2 hours 30 minutes; 100 marks)	40
Paper 2 – Computing theory (written, 2 hours 30 minutes; 100 marks)	40
Non-exam assessment – Computing practical project (75 marks)	20

Additional Information: This subject is listed as a 'Useful' A-level by the Russell Group of Universities for Medicine, Engineering, Mathematics and Science related University courses.

Entrance Requirements: There is no requirement, but a grade 7 in GCSE Electronics or Computing would show a suitable standard.

The department have actively chosen the AQA specification over the OCR version due to its greater emphasis on programming which aligns with the departments philosophy of centring programming at the heart of Computer Science.