

## Computer Science

### Advanced General Certificate of Education (A level)

There have been substantial developments in technology over the past twenty years. The world we live in:

- 47,000 apps are downloaded every minute.
- 2+ million search queries performed every minute.
- Autonomous cars are being tested and likely to soon be common on our roads.
- Computers are being used to make medical diagnoses with a greater accuracy than doctors.

#### Course Content:

AQA Computing syllabus will cover 12 units, six of which will be delivered in the first year of the course. In the second year, the remaining six topics will be delivered along with a non-exam assessment.

#### Unit 1 - 2: Fundamentals of programming and data structures.

The students will study the fundamentals of programming basics, basic operations, structured programming and object-oriented programming concepts. The second unit covers data structures, queues and stack, graphs and trees, hash tables and vectors.

#### Unit 3 - 4: Fundamentals of algorithms and computational thinking.

The students will study searching and sorting algorithms using binary, binary tree and linear search. In Unit four the students will explore computational thinking which includes abstraction and automation, finite state machines and The Turing machine.

#### Unit 5 - 6: Fundamentals of data representation and computer systems.

The students will study the binary number system, coding systems and encryption. In computer systems, the students will explore hardware and software, Boolean algebra and logic gates.

#### Unit 7 - 8: Fundamentals of computer architecture and uses of computing.

The students will study internal hardware components of a computer system. They will also look at moral, ethical, legal and cultural issues of computer uses in society today.

#### Unit 9 - 10: Fundamentals of computer networking and databases.

The students will explore networking communication basics and internet security applicable in networks today. In addition to this they will create and study relational databases using SQL.

#### Unit 11 - 12: Fundamentals of functional programming and software development.

The students will study basics of functional programming, including writing functional programs. In the final unit, they will study the aspects of software development.

#### Career Opportunities:

In the future computers will play more and more of an integral role in our day to day lives and it is hard to envisage many careers where an understanding of how technology works will not be important.

Software Developer

Programmer

Software Engineer

Games Developer

UX Analyst

Data scientist