

Computer Science

Pathway 1

Course description:

Computer Science aims to provide students with a practical and theoretical look at the science behind computation. Students will learn about binary and logic as well as how computers operate, their strengths and their limitations. This course also provides students with the opportunity to learn several programming languages.

Qualifications required:

- In line with the entry requirements for a Pathway 1 subject.
- Grade 6 in GCSE Maths or Computer Science

Aims of the course:

- Analyse a problem and identify the parts which are appropriate for a computer-based solution;
- Select, justify and apply appropriate techniques and principles to develop data structures and algorithms for the solution of problems;
- Design, implement and document an effective solution using an appropriate programming language.
- Develop knowledge and understanding of the theoretical topics involved in Computer Science.

Future prospects:

An A Level in Computer Science can lead to a number of career opportunities and/or University courses, Web designing, Programming, Control systems, Systems Analyst, Business and Information Systems. The data processing skills are of particular benefit in any science based professions.

Student feedback:

"I really enjoyed Computer Science, it was a good alternative to ICT and it allowed me to do lots of programming."

Subject Teachers:

Mr Maher

Computer Science

Features of the course:

Students will be able to;

- Describe and explain the use and impact of Computer Science in a range of applications and show an understanding of the characteristics of computer systems (hardware, software and communication) which allow effective solutions to be achieved;
- Design and implement solutions to problems using console based and graphical programming languages.
- Understand low level computing concepts such as different base number systems, binary logic and the inner workings of a processor.
- Comment critically on the social, economic, legal, ethical and other consequences of the use of computers.

Year 12 Units

- Fundamentals of programming
- Fundamentals of data structures
- Systematic approach to problem solving
- Theory of computation
- Fundamentals of data representation
- Fundamentals of computer systems
- Fundamentals of computer organisation and architecture
- Consequences of uses of computing
- Fundamentals of communication and networking

Year 13 Units

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

Methods of Assessment:

Paper 1 (On screen Exam) – 60% of Year 12

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

Paper 2 (Written Exam) – 60% of Year 12

- Fundamentals of data representation
- Fundamentals of computer systems
- Fundamentals of computer organisation and architecture
- Consequences of uses of computing
- Fundamentals of communication and networking

Paper 1 (On screen Exam) – 40% of A-Level

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

Paper 2 (Written Exam) – 40% of A-Level

- 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

Non-exam assessment - both Year 12 and Year 13 20% of A-Level

The non-exam assessment assesses student's ability to use the knowledge and skills gained through the course to solve or investigate a practical problem. Students will be expected to follow a systematic approach to problem solving.