RMGS
COMPUTER SCIENCE
A LEVEL

What are the aims of the course?

This course is suitable for students who have a keen interest in computers and who want to know more about how they work. It aims to encourage computational thinking and problem solving skills through the use of computer programming.

A Level Modules

Paper 1:

40% of the total A-level marks

This is assessed by means of a 2½ hour on-screen examination.

This module covers:

- Fundamentals of programming
- Fundamentals of data structures
- Fundamentals of algorithms
- Theory of computation

Paper 2:

40% of the total A-level marks

This is assessed by means of a 2½ hour written examination.

This module covers, amongst other topics:

- Fundamentals of data representation
- Fundamentals of computer systems
- Fundamentals of computer organisation and architecture
- Fundamentals of functional programming

Paper 3:

20% of the total A-level marks

This module is internally assessed and externally moderated. Candidates will be required to document the stages of a programmed solution to a real problem associated with a user whose realistic needs should be taken into account when specifying, designing and implementing the solution.

This module covers:

- Systems development, incorporating analysis, design, implementation, testing, training, maintenance and evaluation

Are there any specific entry requirements?

To study COMPUTER SCIENCE you need have no formal qualification in the subject, but due to the high proportion of computational thinking, this course is better suited to those students with a strong mathematical/scientific background. You will therefore need to have at least a 7 in GCSE Mathematics. If you have completed the Computing GCSE, your grade should be a minimum of a 6.

Why is it a useful qualification?

The course is not about learning to use tools or just training in a programming language. Instead the emphasis is on computational thinking. Computational thinking is a kind of reasoning used both by humans and machines. Thinking computationally is an important life skill. Thinking computationally means using abstraction and decomposition. The study of computation is about what can be computed and how to compute it. Computer Science involves questions that have the potential to change how we view the world. For example, we may be computing with DNA at some stage in the future with computer circuits made of genes. This leads to the question does the natural world 'compute'?

Experimental Computer Science can be done with computers where we can learn more about the natural world by observing the emergent behaviour of a colony of interacting software agents in a simulation. Computing/Computer Science is about designing new algorithms to solve new problems. In this sense Computer Science is no more about computers than astronomy is about telescopes. Many great challenges lie in the future for Computer Scientists to solve. This course, with its emphasis on abstract thinking, general problem solving, algorithmic and mathematical reasoning, scientific and engineering-based thinking, is a good foundation for understanding these future challenges.