SUBJECT: COMPUTER SCIENCE
Title of GCE: A Level Computer Science
Exam Board: OCR
Syllabus Number: H446 601/4911/5
Single or Double Award: Equivalent to one A Level (single)

General Information:
A Level Computer Science qualification helps students understand the core academic principles of computer science. Classroom learning is transferred into creating real-world systems through the creation of an independent programming project. This A Level will develop the student's technical understanding and theoretical comprehension of computer science, and their ability to analyse and solve problems using computational thinking.

A Level Assessment:

Exam – Paper 1 Computer Systems 40% , Paper 2 Algorithms and programming 40%

Coursework/Controlled Assessment: Programming Project 20%

Brief outline of coursework/controlled assessment:

Coursework:

This will introduce learners to the internal workings of the Central Processing Unit (CPU), the exchange of data and will also look at software development, data types and legal and ethical issues. It is expected that learners will draw on this underpinning content when studying computational thinking, developing programming techniques and devising their own programming approach in the Programming project component.

Learners will be expected to apply the theory of computer systems to different contexts including current and future uses of the technologies.

As a part of the algorithms and programming element of the course the students will incorporate and build on the knowledge and understanding gained in the Computer systems component and understand the principles of solving problems by computational methods.

In addition, learners should:

- understand what is meant by computational thinking
- understand the benefits of applying computational thinking to solving a wide variety of problems
- understand the principles of solving problems by computational methods
- be able to use algorithms to describe problems
- be able to analyse a problem by identifying its component parts

Controlled Assessment:

Learners will be expected to analyse, design, develop, test, evaluate and document a program written in a suitable programming language for a project of their own design and choosing. The underlying approach to the project is to apply the principles of computational thinking to a practical coding problem. Learners are expected to apply appropriate principles from an agile development approach to project development.

While the project assessment criteria are organised into specific categories, it is anticipated the final report will document the agile development process and elements for each of the assessment categories appearing throughout the report.

Career Opportunities:

Information and Technology Management, Engineering, Manufacturing, Construction, Broadcast Media, Medical Technology, Computer Programming, Computer Aided Research, Software Developer, IT Technician, Web Developer, Network Engineer, Civil Engineering Technician.

Students who study this subject often complement it with:

Business Studies, Maths, Science

For more information or advice contact:

Ms D Williams

Career Opportunities:

This qualification is suitable for learners intending to pursue any career in which an understanding of technology is needed. The qualification is also suitable for any further study as part of any course demanding the application of problem solving.

It will provide learners with a range of transferable skills which will facilitate personal growth and foster cross curriculum links in areas such as maths, science and design and technology. Computer Science is a very creative subject and skills such as problem solving and analytical thinking will all be refined and explored as learners progress through the learning and assessment programme

Computer Science is highly valued among universities, as technology is fast developing in this day and age. They need students that can adapt to this, and handle possibly more difficult tasks that other students may not be able to do. University undergraduate science and mathematics courses require students to be able to program as the use of computer technology and sciences & mathematics become increasingly interdependent. Post education businesses are grappling with the enormous challenges surrounding cyber security, quantum computing, Internet of Things, Algorithmic bias, machine learning, and artificial intelligence yet year on year there are fewer students leaving education equipped to fill these roles.

The combination of A-Level Computer Science, Graphic Design and Arts is good for students who are looking to go into graphic design, or even video game animation. This combination of A-Levels mixes logical with the creative, to show that you can apply yourself to anything. The programming project offers the chance to build your own computer game and students who apply their more creative skills have the opportunity to demonstrate significant independence and flair in their projects. ***Universities love to see this in students, as it means that they can stretch and succeed in whatever they put their mind to.***

Applied and job-related learning

There is a range of vocational qualifications (such as BTECs, NVQ/SVQs, and diplomas) linked to a qualification in computer science, such as:

- construction and the building environment
- electrical engineering
- applied science
- computer science
- computer aided design
- computer programming
- computer aided engineering
- engineering
- information technology

Apprenticeships

There is a range of apprenticeships that link to a qualification in computer science, including:

- civil engineering technician
- installation electrician
- software developer
- network engineer
- IT support
- IT technician
- IT analyst programmer
- web developer
- sound technician

Skills and qualities gained from studying A level Computer Science

- **Teamwork**
  You'll need to be able to listen to other team members and take on board each other's opinions and ideas.
- **Technical ability**
  You may need particular technical skills and specialist knowledge of how things work or need to be designed and built.
- **Problem solving**
  Some jobs particularly require problem solving skills and creative thinking to recognise problems and their causes, to identify a range of possible solutions and then assess and decide the best way forward.
- **Organisation**
  You'll need to be able to plan and schedule work. This could include being able to prioritise what needs to be done and by when.
- **Numeracy**
  You'll need to have a good standard of arithmetic. This could mean dealing with statistics, budgets, or doing complicated sums.
- **Communication**
  If your job requires verbal communication, you may need to write or give speeches and presentations. For jobs which require written communication skills, you will need to write clearly and convincingly – you could be producing or dealing with legal documents or writing articles for a newspaper. You may also require good listening skills, the ability to negotiate, or to be persuasive.
- **Creativity**
  You may need specific artistic or design skills for a job, or you may need to draw on a good imagination to come up with creative solutions to business challenges.
- **Attention to detai**l
  You'll need to be thorough and focused on details of a task. You'll monitor and check work, information, or plans.
- **Analytics**
  You'll be collecting and examining information in detail to arrive at a solution, to answer a key question or make an informed decision.

Students who study this subject often complement it with:

1) Physics and Mathematics
2) Chemistry and Physics
3) Graphic Design and Art

For more information or advice contact: Ms Williams and/or Mr Williams