QUEEN'S COLLEGE TAUNTON

Computer Science A Level

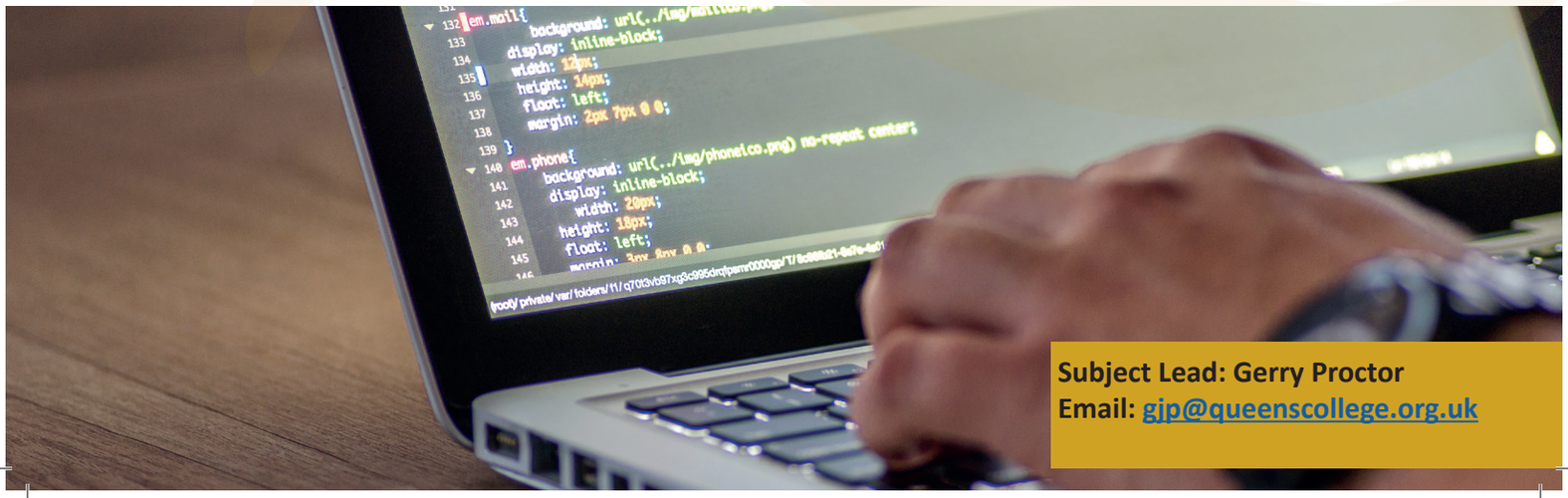
Overview
ICT- both desktop and mobile- is becoming totally integrated within education at Queen's College and is embedded across all subjects in the curriculum. Every department has integrated computer modules and apps into their schemes of work and the School's wireless network is extensive. There are 330 connected computers on site giving instant access to the Internet, e-mail and other resources. The majority of the computers are Intel-based PCs and laptops however pupils are increasingly using mobile devices and tablets such as iPads and Netbooks and even mobile phone technology, both in and out of the classroom.

Why Study?
Computer Science is a practical subject where students can apply the academic principles learned in the classroom to real-world systems. It is an intensely creative subject that combines invention and excitement and can look at the natural world through a digital prism. While having already studied Computer Science would be beneficial, students following this specification do not need to have any prior knowledge of Computer Science. However, the mathematical content of this course makes a high pass grade in GCSE Mathematics a prerequisite. The course is not just about training in a particular programming language but instead covers a wide range of computing topics. These include both the areas of computational thinking as well those covering how computer technology impacts our world. Computational thinking is a kind of reasoning used by both humans and machines which allows the creation of a computational solution for a given problem. This begins with the abstraction and decomposition of the problem and leads through to ultimately providing a coded solution. Computer Science involves questions that have the potential to change how we view the world, from robotics to AI. Considered a strong course by Universities, the course is no less challenging than the other sciences, while providing many interesting and fun areas of study for interested students.

Course Overview
In A level Computer Science, the student will follow the OCR curriculum. This entails study in the following components:

1. Computer Systems (40% of total / written paper)
- The characteristics of processors
- Software and software development
- Exchanging data
- Data types, structures and algorithms
- Legal, moral, cultural and ethical issues
- Boolean Algebra and Floating Point Arithmetic

2. Algorithms and Programming (40% of total / written paper)
- Elements of computational thinking
- Problem solving and programming
- Algorithms to solve problems
- Standard and advanced algorithms



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3. Programming Project (20% of total / non-exam assessment)

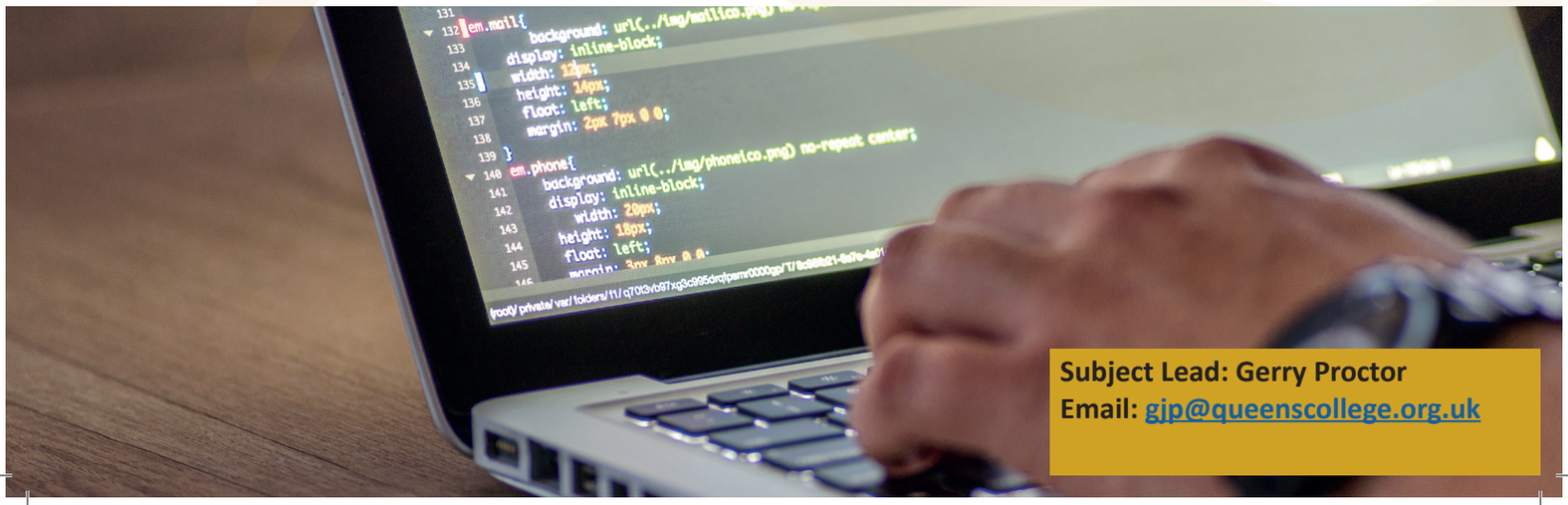
- Analysis of the problem
- Design of the solution
- Developing the solution
- Evaluation

Programming languages will be taught to meet curriculum needs:

- Python - Students will be taught to code to a higher level of fluency in this language.
- Assembly Code- Students will be taught basic coding in a single Assembly Language.
- HTML / CSS / Java Script / SQL- Students will be taught to identify/use basic phrases in context.

Progression

This specification has been designed for students who wish to go on to higher education courses or employment where knowledge of Computing would be beneficial. Computer Science is considered a strong A Level, comparable to any of the other science exams. It can thus be used as a direct aid towards a career in any STEM field or to support aims in fields outside this, such as Business, Economics or Politics.



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