KING EDWARD VI
Handsworth School For Girls

COMPUTER SCIENCE

Examination Board: AQA
Specification: Advanced GCE 7517

www.aqa.org.uk/subjects/computer-science-and-it/as-and-a-level/computer-science-7516-7517

Why should I study Computer Science?
We use computer systems in most aspects of our lives including at work, in our leisure time and to communicate with each other. Studying Computer Science will prepare you for university study and numerous careers as it will expand your understanding of how these computers work whilst developing a range of valuable transferable skills such as the ability to think logically, analytically and creatively to solve problems.

What will I learn about?
Throughout the course you will develop both theoretical knowledge of Computer Science and practical programming skills. You will learn how to develop complex algorithms and how to implement them. You will use Python 3 as your main programming language but also experience other languages whilst studying procedural, object oriented and functional programming techniques. You will learn more about computer architecture, communications and networking, fundamentals of data representation and data structures as you develop your understanding of the theory that underpins computer systems.

Paper One
1. Fundamentals of programming
2. Fundamentals of data structures
3. Systematic approach to problem solving
4. Theory of computation
5. Fundamentals of algorithms

Paper Two
6. Fundamentals of data representation
7. Fundamentals of computer systems
8. Fundamentals of computer organisation and architecture
9. Consequences of uses of computing
10. Fundamentals of communication and networking
11. Fundamentals of databases
12. Big Data
13. Fundamentals of functional programming

NEA – the computing practical project
You will work independently on a topic that you choose, developing your practical programming skills to develop a solution to a realistic problem. You will analyse the problem, design, create, test and evaluate a solution with your technical solution being the most important element of this. Unlike GCSE you work on your project outside as well as in lesson time; in study periods and at home.

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A few examples of the type of problem you might choose to solve:

- A computer game
- A control system operated using a device such as a Raspberry Pi
- A website with dynamic content driven by a database back-end
- An app for a mobile phone

- A simulation of a business or scientific nature such as modelling flu epidemics
- A solution to a data processing problem for an organisation such as a membership system
- A solution to an optimisation problem such as production of a rota

How will I be taught?
You will be taught by specialist teachers who will employ a range of learning and teaching techniques to help you develop your understanding and apply the theory to practical computing. You will participate in group and individual work, presentations, discussions and will need to undertake your own research. You will be given problems to solve and tackling them will require resilience and perseverance. The content will be delivered through both practical and theoretical lessons using text books and electronic resources and allowing you to link computing principles to real-life practice.

Application beyond school:
Studying Computer Science will equip you with technical and transferrable skills which are highly regarded by universities and employers, skills such as the ability to apply logic creatively and to problem solve. The ability to write computer programs is a valuable skill, not just if you are looking to undertake a degree in Computer Science, but also if you are considering a degree in a range of other subjects including Physics and Engineering. Computer Science can lead to a wide range of careers including as a programmer, software designer, software engineer or scientific researcher as well as in the fields of finance, business, government and teaching to name a few.

Assessment Format:

Level	Component	Requirements	Duration	Marks
A Level	Paper 1 On-screen examination	Topics 1 - 5	2 hrs 30 mins Year 13	40% of A Level
A Level	Paper 2 Written examination	Topics 6 - 13	2 hrs 30 mins Year 13	40% of A Level
A Level	Non-exam assessment	Solve or investigate a practical problem		20% of A Level

Are there any special requirements?
We expect you to have grade 7 or above for GCSE Computer Science. You should also be a logical thinker who enjoys problem solving and Mathematics so a good grade in GCSE Mathematics is useful. If you are considering Computer Science as a degree course at university you will need also to take A Level Mathematics. We will expect you to keep up-to-date with the fast-evolving world of Computer Science.

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