Southend High School for Girls
Sixth FORM

Course outline

Head of Department:
Mr D Holmes

Minimum entry requirements:
Grade 6 in GCSE Mathematics

Computer Science

Discover how computing shapes the world around us and unlock skills that can power your future. As you learn to code and tackle real-world problems through programming, you'll sharpen your problem-solving skills and gain a deeper understanding of the digital systems that underpin modern life. Computer Science is not only exciting and intellectually rewarding but also one of the most in-demand fields today, opening doors to a wide range of high-value careers in a rapidly growing industry.

What will you study in Year 12?

Computer systems

Core hardware components, data representation, system software, networking, and exchanging data

Algorithms and programming

Learning to program in a high level language using OOP, recursion.

Programming project

Using the Defold integrated development environment. Analysing and designing the 2d arcade game project.

What will you study in Year 13?

Programming project

Designing the solution for your 2d arcade game, implementing and testing the prototypes. Evaluating your solution.

Algorithms and programming

Standard sorting and searching algorithms, computational thinking, graph traversals, and complexity measures.

Computer systems

Essential data structures, Boolean algebra, and ethical / legal issues.

How will you be assessed during the course?

In school assessments

You will complete activities based on the units of work that we are studying to show your understanding. You will also write code to solve problems and debug code with errors to show mastery of the Python language, Object Oriented programming and the Defold IDE for games programming.

External assessments

The examination board is OCR.

Specification: GCE Computing Science A-level

Code: H446

There are three modules assessed in May/June of the Year 13.

- Computer Systems (01): Covering the fundamental computing knowledge required to support all subsequent units of study. (40%)
- Algorithms and Programming (02): Computational Thinking, Programming Techniques and Logical Methods. (40%)
- Programming Project(03): A substantial user-driven project, requiring analysis and design, which is developed over an extended period of time. (20%)

What skills will I develop?

The course will enable you to:

- Work in small teams to analyse problems, design algorithms and write programs;
- Develop the ability to apply skills, knowledge and understanding of computing, including programming, in a range of contexts to solve problems;
- Gain an understanding of the consequences of using computers, including legal, moral, cultural and ethical issues.

Continued over

Where will this course lead?

A Level Computer Science is an ideal launchpad into technology's future. Many students continue to study Computer Science or related fields at university, specialising in areas like AI, cybersecurity, robotics, or game development.

Further Information

What other subjects should I study with Computer Science?

Computer Science is compatible with most other A-level subjects. Students who opt for Computer Science find it complements a wide range of other subjects; courses such as Mathematics, Further Mathematics, Economics, Psychology and Physics are a good combination to take with Computer Science.

Supercurricular activities that are available

Students attend lunchtime workshops to collaborate on coding and solve algorithmic problems. Each year, the department enters students in the Bebras computational thinking competition, where they test their programming skills against top UK schools.

Extension and support that is offered

Students can attend one-to-one or group sessions during lunchtime workshops, to help master and understand the theory and application of concepts and code.

Further information

Examination board

http://www.ocr.org.uk/qualifications/as-a-level-gce-computer-science-h046-h446-from-2015/

Careers in Computer Science

https://isaaccomputerscience.org/careers_in_computer_science