

Computer Science

Advanced Level

General Information

The aims of this qualification are to enable learners to develop:

- an understanding of computational thinking and ability to apply the fundamental principles and concepts of computer science including; abstraction, decomposition, logic, algorithms and data representation
- the ability to analyse problems in computational terms through practical experience of solving such problems including writing programs to do so
- the capacity for thinking creatively, innovatively, analytically, logically and critically
- the capacity to see relationships between different aspects of computer science
- mathematical skills
- the ability to articulate the individual (moral), social (ethical), legal and cultural opportunities and risks of digital technology.

The course focuses on programming, building on GCSE Computing and emphasise the importance of computational thinking as a discipline.



Examination details

Assessment overview

Module	% of Grade	Duration	Type of assessment
1	40%	2hr 30mins	Written paper - 140 marks
2	40%	2hr 30mins	Written paper - 140 marks
3	20%	Programming project	Coursework - 70 marks

Entry requirements

You must have at least a grade 6 in GCSE Maths and a grade 5 in GCSE English. Students should have ideally studied GCSE Computer Science and gained a grade 6. Students who have not studied GCSE Computer Science or who have not achieved these grades should speak to subject staff.

You should also meet the general college entry requirements for advanced level study. Please refer to the current prospectus - advanced programmes, entry requirements.

In this subject, particular skills and aptitudes will be required, many of which will be demonstrated by students' GCSE profiles.

Entry requirements might be changed in light of curriculum reform.

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Course content

Unit 01 Computer systems

This component will be a traditionally marked and structured question paper with a mix of question types: short-answer, longer-answer, and levels of response mark scheme-type questions. It will cover the characteristics of contemporary systems architecture and other areas including the following:

- Software and its development
- Types of programming languages
- Data types, representation and structures
- Exchanging data and web technologies
- Following algorithms
- Using Boolean algebra
- Legal, moral and ethical issues.

Unit 02 Algorithms and Programming

This component will be a traditionally marked and structured question paper with two sections, both of which will include a mix of question types: short-answer, longer-answer, and levels of response mark-scheme-type questions.

Section A

- Traditional questions concerning computational thinking
- Elements of computational thinking
- Programming and problem solving
- Pattern recognition, abstraction and decomposition
- Algorithm design and efficiency
- Standard algorithms.

Section B

There'll be a scenario/task contained in the paper, which could be an algorithm or a text page-based task, which will involve problem solving.

Unit 03 Programming project

- External postal moderation or repository
- Students and/or centres select their own user-driven problem of an appropriate size and complexity to solve
- This will enable them to demonstrate the skills and knowledge necessary to meet the Assessment Objectives
- you will need to analyse the problem, design a solution, implement the solution and give a thorough evaluation

How it is taught

A Level Computer Science focuses on programming, building on GCSE Computing and emphasise the importance of computational thinking as a discipline. It also focuses on maths, much of which will be embedded within the course. It puts computational thinking at its core, helping you to develop the skills to solve problems, design systems and understand human and machine intelligence. You apply the academic principles learned in the classroom to real world systems in an exciting and engaging manner.

Lessons and homework contain a combination of theory and practical work. Unlike IT, the majority of the assessment for this course is examinations (80% written exams and 20% Coursework) although the balance between practical and theory in the classroom will be roughly 50/50. The computing room has been designed and equipped specifically to teach Computer Science in a flexible way, using mobile technologies including laptops, tablets and is Bring Your Own Device (BYOD) capable.

Useful / common subject combinations

A Level Maths or Physics

Careers / HE information

This course gives you a clear progression into higher education or employment where knowledge of Computer Science would be beneficial, as the course was designed after consultation with members of British Computer Society (BCS), Computing At School (CAS) and top universities.