



# ***COMPUTER SCIENCE***

**Gordon's  
Sixth Form**

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**A LEVEL**

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## What sort of work will I be doing?

At A Level we aim to make learning as active as possible. Demonstrations, practical work and theory are all blended to give the students a well-rounded education as a computer scientist.

We believe students gain a greater understanding by experiencing the subject first hand. Students will work individually and in small groups completing tasks that develop skills alongside knowledge.

A major component of the course is coursework, with an individual project forming 20% of the full A Level. A substantial amount of work will be required in documenting the analysis, design and evaluation of the system as well as in development of the software.

## What is the department like?

The Computer science department has two well-equipped suites in a standalone building. These are fitted with modern PCs, which are updated on a regular basis, and LED screens for demonstrations and presentations.

All computers are connected to the school Network, which also provides access to our resources and to the Internet. Students are allocated a cloud storage area to store their school work and are provided with a school email address. The rooms contain peripheral devices including a colour laser printer. Friendly and enthusiastic teachers, who are supported by a team of efficient technicians, teach on the courses.

A Level Computer Science is well established at Gordon's. The Department has enjoyed an excellent pass rate at GCSE in recent years and it is possible to achieve at the highest standard in what is acknowledged nationally to be a difficult subject.

## What is the course about?

A Level Computer Science is a lot more than just "playing about with computers!" Although the practical aspects of the subject form an enjoyable

part of the course, at its heart Computer Science is about a systematic approach to solving problems. This, together with a firm basis of facts about computer systems, provides a course that is recognised for its academic worth alongside the more traditional subjects.

The first year of the course provides an overview of computer systems and their applications. During this year you will develop some introductory programming skills. In the second year, we look in more detail at systems development, processing and programming techniques.

## What are the entry requirements?

Alongside the normal entry requirements for Gordon's Sixth Form, student's wishing to study Computer Science should have obtained at least a Grade 6 in GCSE Computing, however if they have not studied Computing at GCSE then a Grade 6 in GCSE Mathematics is required. The Mathematics grade is particularly important because of the logical, mathematical and problem solving skills in Computer Science.

Although many of our students already have well developed IT skills, there is no requirement for a formal qualification in Computer Science or ICT.

If you have never programmed before it is recommended you increase your knowledge in this area by using online tutorials or books.

## How will I be assessed?

This A Level is assessed predominantly by an on-screen test (40%) and written exam paper (40%) which covers topics covered in the first and second year. There is also an individual project worth 20% of the assessment. You must enjoy doing coursework – it is a significant element on any advanced Computer Science course.



### What skills will I develop?

Computer Science will provide the opportunity to develop your skills in information technology and communication, as well as improving your planning and study skills.

In particular, your project report will give you the opportunity to demonstrate your skills in written communication and information technology.

### What extra work can I do?

Students are encouraged to look for articles on computing applications in books, newspapers, magazines and on the Internet. Practical use of a wide range of software can provide valuable preparation, however this does not include your favourite computer game!

If you like the challenge of advanced software development, then Computer Science is for you! The skills you learn will serve you well in both Higher Education and in your working life.

### What are the progression routes for this qualification?

A Level is an excellent qualification both for those who wish to go straight into work and for those who want to continue into Higher Education.

If you wish to apply for a computing based degree, you are strongly recommended to combine the course with Mathematics and other scientific subjects.

Computer Science can be combined successfully with other disciplines at A Level.

### IT and computing careers

- Software Engineer
- Video Games Developer
- Web Designer/Developer
- Graphical Designer
- Systems Engineer
- Software Developer
- Business Analyst
- Systems Administrator
- Project Manager

Information Communication and Technology and Computer Science degrees have an excellent reputation and are very popular amongst employers because graduates exhibit high level computer skills, are superb project managers, logical and develop good problem solving skills. Plus most industries are driven by computers and software.

# COMPUTER SCIENCE (A LEVEL)

## HEAD OF DEPARTMENT

Mr J Sumsion

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## Exam Board

AQA

## Specification

7517

## COURSE DETAILS

### Examination

The course is examined at the end of Year 13 by 2 exams (1 written 1 on screen). In addition, there is a non-examined assessment (NEA) worth 20% of the final grade completed during the course.

### Unit 1:

This unit focuses on programming using standard programming concepts such as definite and indefinite iteration with conditions, use of arithmetic, relational and Boolean operations. Students will also program using an object-oriented method. Students will also develop their knowledge of the theoretical side of computer science ranging from fundamentals of programming to the theory of computation (abstraction, decomposition, composition and automation). This unit will also include the fundamentals of algorithms and the skills learnt whilst studying the systematic approach to problem solving.

### Unit 2:

This unit focuses on fundamentals of data representation such as natural, rational, irrational, real and ordinal numbers plus different number systems used by computers to represent data. Networking and the Internet. Fundamentals of computer systems includes hardware, software and programming languages as well as computer organization and architecture and consequences of functional programming. This unit also includes fundamentals of databases, big data and the fundamentals of functional programming.

### Unit 3: Non-Exam Assessment – The computing practical project

The non-exam assessment assesses a student's ability to use the knowledge and skills gained through the course to solve or investigate a practical problem. Students will be expected to follow a systematic approach to problem solving. When creating the project, a student will analyse, design, create and test a program to solve a problem, this could be a website with dynamic content and a database back-end, a mobile app, an application for artificial intelligence, a computer game or something completely different.

## HOW WILL I BE ASSESSED?

| Exam Papers Year 13        | % of GCE | Details                                                                                                                                                                                                                                                                            |
|----------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Paper 1                    | 40%      | This is an <b>on-screen exam on unit 1</b> . Students answer a series of short questions and write/adapt/extend programs in an electronic answer document provided by the exam board. 2 sections of the exam will be based on a pre-released skeleton program. 2 Hours 30 Minutes. |
| Paper 2                    | 40%      | This paper tests a student's ability to answer questions from <b>unit 2</b> . The paper consists of compulsory short-answer and extended-answer questions. 2 Hours 30 Minutes.                                                                                                     |
| Unit 3 Non-Exam Assessment | 20%      | The non-exam assessment tests a student's ability to use the knowledge and skills gained through the course to solve or investigate a practical problem. Students will be expected to follow a systematic approach to problem solving.                                             |

## WIDER READING

- The New Turing Omnibus, A K Dewdney, (Palgrave Macmillan, 2003)
- How to Think Like a Mathematician, Kevin Houston, (Cambridge University Press, 2009)
- Computer Science Illuminated Sixth Edition, Nell Dale, John Lewis, (Jones and Bartlett, 2015)







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