

Computer Science

Cambridge International
Examinations Syllabus
Code 9618

IGCSEs needed

Students will need to have an IGCSE grade of **5A*-C** with a minimum **B** grade in Math's

Course Overview

Cambridge International AS Level and A Level Computer Science are accepted by universities and employers as proof of essential knowledge and ability. This syllabus is designed to give greater flexibility both to teachers and to learners. It is envisaged that learners will use the skills and knowledge of computer science acquired through this course in one of three ways:

- to provide a general understanding and perspective of the development of computer technology and systems, which will inform their decisions and support their participation in an increasingly technologically dependent society.
- to provide the necessary skills and knowledge to seek employment in areas that use computer science
- to develop their knowledge and understanding of computer science through entry to higher education, where this qualification will provide a useful foundation for further study of computer science or more specialist aspects of computer science.

Syllabus Units/Topics

AS Level Content

1 Information representation	1.1 Data Representation 1.2 Multimedia – Graphics, Sound 1.3 Compression
2 Communication	2.1 Networks including the internet
3 Hardware	3.1 Computers and their components 3.2 Logic Gates and Logic Circuits
4 Processor Fundamentals	4.1 Central Processing Unit (CPU) Architecture 4.2 Assembly Language 4.3 Bit manipulation
5 System Software	5.1 Operating System 5.2 Language Translators
6 Security, privacy and data integrity	6.1 Data Security 6.2 Data Integrity
7 Ethics and Ownership	7.1 Ethics and Ownership
8 Databases	8.1 Database Concepts 8.2 Database Management System (DBMS) 8.3 Data Definition Language (DDL) and Data Manipulation Language (DML)
9 Algorithm Design and Problem-Solving	9.1 Computational Thinking Skills 9.2 Algorithms
10 Data Types and structures	10.1 Data Types and Records 10.2 Arrays 10.3 Files 10.4 Introduction to Abstract Data Types (ADT)
11 Programming	11.1 Programming Basics 11.2 Constructs 11.3 Structured Programming
12 Software Development	12.1 Program Development Lifecycle 12.2 Program Design 12.3 Program Testing and maintenance

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Assessment Details

At AS Level candidates take papers 1 and 2. At A Level candidates take all four papers. Calculators must not be used in any paper.

Paper 1 Theory Fundamentals

1 hour 30 minutes

75 marks

Paper 1 will assess sections 1 to 8 of the syllabus content.

Written paper.

Externally assessed. Candidates answer all questions.

50% of the AS Level

25% of the A Level

Paper 2 Fundamental Problem-solving and Programming Skills

2 hours

75 marks

Paper 2 will assess sections 9 to 12 of the syllabus content.

Candidates will need to write answers in pseudocode.

Written paper.

Externally assessed. Candidates answer all questions.

50% of the AS Level

25% of the A Level

Paper 3 Advanced Theory

1 hour 30 minutes

75 marks

Paper 3 will assess sections 13 to 20 of the syllabus content.

Written paper.

Externally assessed. Candidates answer all questions.

25% of the A Level

Paper 4 Practical

2 hours 30 minutes

75 marks

Paper 4 will assess sections 19 to 20 of the syllabus content, except for low-level and declarative programming.

Candidates will submit complete program code and evidence of testing.

Candidates will be required to use either Java, VB.NET or Python programming languages.

Externally assessed. Candidates answer all questions on a computer without internet or email facility.

25% of the A Level

Skills Developed

The aims of a course based on Cambridge International AS and AL Computer Science, whether leading to an AS or A Level qualification are:

- to develop computational thinking
- to develop an understanding of the main principles of solving problems using computers
- to develop an understanding that every computer system is made up of subsystems, which in turn consist of further subsystems
- to develop an understanding of the component parts of computer systems and how they interrelate,
- including software, data, hardware, communications and people to acquire the skills necessary to apply this understanding to develop computer-based solutions to problems.

Degree course this will lead to:

Cambridge International A Level Computer Science provides a suitable foundation for the study of computer science or related courses in higher education. Equally, it is suitable for candidates intending to pursue careers or further study in computer science or ICT, or as part of a course of general education. Cambridge International AS Level Computer Science constitutes the first half of the Cambridge International A Level course in computer science and provides a suitable foundation for the study of computer science at Cambridge International A Level and then for related courses in higher education. Depending on local university entrance requirements, it may permit or assist progression directly to university courses in Computer Science or some other subjects. It is also suitable for candidates intending to pursue careers or further study in computer science or ICT, or as part of a course of general education. We recommend learners check the Cambridge recognitions database and the university websites to find the most up-to-date entry requirements for courses they wish to study.