

AS AND A LEVEL COMPUTER SCIENCE

Why choose WJEC AS and A Level Computer Science?

Computer science integrates well with subjects across the curriculum. It demands both logical discipline and imaginative creativity in the selection and design of algorithms and the writing, testing and debugging of programs; it relies on an understanding of the rules of language at a fundamental level; it encourages an awareness of the management and organisation of computer systems; it extends the learners' horizons beyond the school or college environment in the appreciation of the effects of computer science on society and individuals. For these reasons, computer science is as relevant to a learner studying arts subjects as it is to one studying science subjects.

What will I study?

This specification promotes the integrated study of computer science. It will enable learners to develop a broad range of skills in the areas of programming, system development, computer architecture, data, communication and applications.

AS UNITS

Unit 1: Fundamentals of Computer Science

This unit investigates computer architecture, communication, data representation, data structures, software applications, programs, algorithms, logic, programming methodologies and the impact of computer science on society.

Unit 2: Practical Programming to Solve Problems

This unit consists of a series of set tasks completed on-screen by candidates. These tasks will assess the practical application of knowledge and understanding and will require the use of Visual Basic.NET, Python or Java as a programming language.

A2 UNITS

Unit 3: Programming and System Development

This unit investigates programs, data structures, algorithms, logic, programming methodologies and the impact of computer science on society.

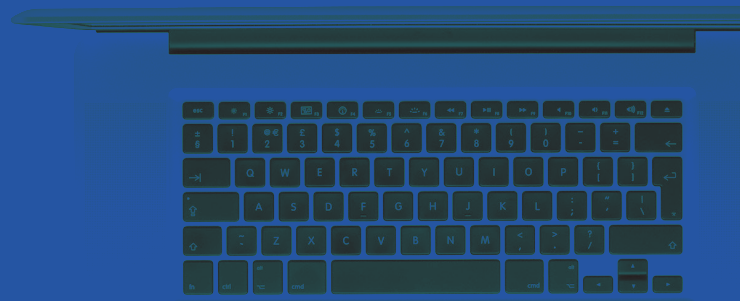
Unit 4: Computer Architecture, Data, Communication and Applications

This unit investigates computer architecture, communication, data representation, organisation and structure of data, programs, algorithms and software applications.

Unit 5: Programmed Solution to a Problem

Candidates discuss, investigate, design, prototype, refine and implement, test and evaluate a computerised solution to a problem chosen by the candidate which must be solved using original code (programming).

This is a substantial piece of work, undertaken over an extended period of time.



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What skills will I develop?

The WJEC AS and A Level in Computer Science encourages learners to develop:

- an understanding of, and the 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.

How will I be assessed?

AS (2 units)		
AS Unit 1 Fundamentals of Computer Science	Written examination: 2 hours	25% of qualification 100 marks
AS Unit 2 Practical Programming to Solve Problems	On-screen examination: 2 hours	15% of qualification 60 marks
A Level (the above plus a further 3 units)		
A2 Unit 3 Programming and System Development	Written examination: 2 hours	20% of qualification 100 marks
A2 Unit 4 Computer Architecture, Data, Communication and Applications	Written examination: 2 hours	20% of qualification 100 marks
A2 Unit 5 Programmed Solution to a Problem	Non-exams assessment	20% of qualification 100 marks

Careers with Computer Science

Computers are widely used in all aspects of business, industry, government, education, leisure and the home. In this increasingly technological age, a study of computer science, and particularly

how computers are used in the solution of a variety of problems, is not only valuable to the learners but also essential to the future well-being of the country.