

Computer Science

A-LEVEL



Examination Board: OCR

Course content:

OCR Computer Science is above all else relevant to the modern and changing world of computing. Computer Science is a practical subject where learners can apply the academic principles learned in the classroom to real world systems. It is an intensely creative subject that combines invention and excitement, and can look at the natural world through a digital prism. OCR's A Level in Computer Science will value computational thinking, helping learners to develop the skills to solve problems, design systems and understand the power and limits of human and machine intelligence. Learners will develop an ability to analyse, critically evaluate and make decisions. The project approach is a vital component of 'post-school' life and is of particular relevance to Further Education, Higher Education and the workplace. Each learner is able to tailor their project to fit their individual needs, choices and aspirations.

The key features of this specification encourage:

- emphasis on problem solving using computers
- emphasis on computer programming and algorithms
- emphasis on the mathematical skills used to express computational laws and processes, e.g. Boolean algebra/logic and comparison of the complexity of algorithms
- less emphasis on ICT.

| Content Overview | Assessment Overview | |
|--|---|--|
| <ul style="list-style-type: none"> • The characteristics of contemporary processors, input, output and storage devices • Software and software development • Exchanging data • Data types, data structures and algorithms • Legal, moral, cultural and ethical issues • Elements of computational thinking • Problem solving and programming • Algorithms to solve problems and standard algorithms <p><i>The learner will choose a computing problem to work through according to the guidance in the specification.</i></p> <ul style="list-style-type: none"> • Analysis of the problem • Design of the solution • Developing the solution • Evaluation | <p>Computer systems</p> <p>140 marks 2 hours and 30 minutes written paper</p> | <p>40% of total A level</p> |
| | <p>Algorithms and programming</p> <p>140 marks 2 hours and 30 minutes written paper</p> | <p>40% of total A level</p> |
| | <p>Programming project</p> <p>70 marks Non-exam assessment</p> | <p>20% of total A level</p> |

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Computer Science *(Continued)*

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 questions. It will cover the characteristics of contemporary systems architecture and other areas including the following:

- The characteristics of contemporary processors, input, output and storage devices
- Software and software development
- Exchanging data
- Data types, data structures and algorithms
- Legal, moral, cultural and ethical issues.

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 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.

03 PROGRAMMING PROJECT

Students select their own user-driven problem of an appropriate size and complexity to solve from a given list. This will enable them to demonstrate the skills and knowledge necessary to meet the Assessment Objectives. Students will need to analyse the problem, design a solution, implement the solution and give a thorough evaluation.

Aims:

The aims of the OCR Computer Science course are to widen participation in vocational or work-related learning with a view to equipping learners with skills they will need in the workplace or in Further Education and training. They will also allow students to experience vocationally related learning to see if it is suitable for them. The course focusses more on the technical side of computer use rather than the creative uses.

Possible careers:

This qualification is designed to enable learners to enter employment as a programmer, operative or trainee within a wide range of Information and Communication Technology environments. Such learners would normally enter employment through a work-related training programme. The course has been designed to provide a broad educational basis for Further Education or for moving into employment within the ICT sector. Students will develop the technical skills, knowledge and understanding needed to work within the sector.