



# OCR A LEVEL COMPUTER SCIENCE

## Curriculum Intent

The A-Level Computer Science course aims to develop students' computational thinking, equipping them with essential skills to solve problems, design systems, and understand the dynamics of human and machine intelligence.

Here at Anglo, we prioritise extending education beyond the classroom, encouraging students to gain practical skills. As part of the course, students will visit innovative technological centres through trips and work experience. This exposure broadens their understanding of computing and helps them to make informed decisions for their internally assessed coding projects.

*"A COMPUTER WOULD DESERVE TO BE CALLED INTELLIGENT IF IT COULD DECEIVE A HUMAN INTO BELIEVING THAT IT WAS HUMAN". Professor Alan Turing*

### Students will learn:

#### Component 1:

- 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

#### Component 2:

- Elements of Computational Thinking
- Problem Solving and Programming
- Algorithms to Solve Problems and Standard Algorithms

#### Programming Project:

Students will undertake a project involving:

- Analysis
- Design
- Development
- Evaluation

### Knowledge, understanding & Skills

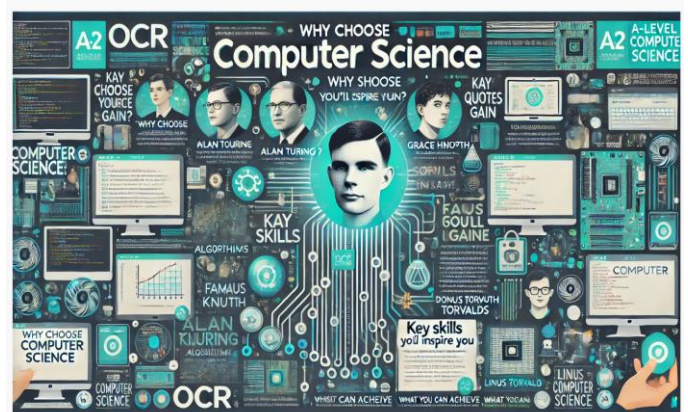
#### Key Concepts:

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

- An understanding of 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.

### How will we assess impact?

- Regular half termly end of topic tests.
- NEA project to be assessed through regular feedback on showbie cross checked against an interactive check list.
- Formative assessment to take place within each lesson, using targeted questioning to make sure students understand the concepts they are utilising.
- Live marking of long answer questions utilised through socratic referencing candidate exemplars from the exam board.



## How can you enhance your learning at home?

- Extra sessions are available after school in C30 every Monday, where students can have access to computers to continue working on their project and general revision. A teacher will be on hand to offer guidance and support.
- The resources utilised in class are available for students to access after the lesson on showbie and links will be posted where appropriate.
- Regular topic related homework, educational link will be made available to students to enhance their learning.
- Past paper questions will be given to students regularly as part of their deliberate exam practice. These will be reviewed by the teacher in the next lesson.

## What does excellence look like?

### Theoretical Understanding

- Strong grasp of computational thinking, including abstraction, decomposition, pattern recognition, and algorithm design.
- Understand formal methods and models of computation, such as finite automata and Turing machines.

### Programming proficiency

- Ability to approach problems from multiple angles and develop innovative solutions.
- Use of creative methods in designing user interfaces, software architecture, and solving complex problems.

## International Opportunities

### Visits Programmes

- International Day
- Community lectures and work experience in computing related industries.
- Computing opportunities linked to international exchange programme.
- Visits to the National Computing Museum.

### Within the curriculum

- Understanding how computing and technology affect societies and cultures worldwide.
- Awareness of global issues in computing such as data privacy, cybersecurity, and ethical considerations in AI.

### Further student development

- Students are given a list of appropriate extra computer science content they can study in their own time to make sure they have a variety of suitable examples to draw from.
- Students have the opportunity to apply their understanding through their own practical work to demonstrate their understanding of computer science through their NEA project work.
- Students would benefit from independent programming to enhance their programming skills. They must be willing to commit time and effort to programming to give themselves a good chance of doing well in the NEA and component 2.
- They must also be willing to invest time into researching viable projects to do for their NEA.



**"THE BEST PROGRAMS ARE WRITTEN SO THAT COMPUTING MACHINES CAN PERFORM THEM QUICKLY AND SO THAT HUMAN BEINGS CAN UNDERSTAND THEM CLEARLY."**

*Donald Knuth*