

# A-LEVEL COMPUTING



INFORMATION  
for students and parents

2025 ENTRY

# COMPUTER SCIENCE

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Computer Science is a dynamic and practical subject, allowing students to apply theoretical principles to real-world systems. It combines creativity and innovation, offering a unique way to understand the modern world through a digital lens. The course aims to develop:

- A solid understanding and the ability to apply fundamental principles of computer science, including abstraction, decomposition, logic, algorithms, and data representation.
- Skills to analyse problems in computational terms, with hands-on experience in writing and developing programs to solve them.
- The capacity to think critically, logically, creatively, and analytically.
- An understanding of how different aspects of computer science interrelate.
- Strong mathematical skills that underpin problem-solving and analytical thinking.

Computer Science strongly complements subjects like Mathematics and Physics. The logical thinking, problem-solving, and analytical skills developed in Maths directly support the algorithms and data manipulation in Computer Science. Meanwhile, the understanding of physical systems in Physics aids in grasping the hardware and mechanics behind computing. The intersection of these subjects gives students a holistic view of how digital systems can be applied to solve both theoretical and practical challenges.

As CAS (Computing at School) states: “At its heart lies the notion of computational thinking: a way of approaching problems that goes beyond software and hardware, providing a framework to reason about systems and challenges.”

A-level Computer Science equips students with vital skills for a rapidly changing, technology-driven world. With technology playing an ever-growing role in every industry, this course is highly relevant. It allows flexibility, enabling students to learn using various programming languages suited to their needs and interests.

This qualification not only values computational thinking but also helps learners to design systems, solve complex problems, and explore the capabilities and limitations of both human and machine intelligence. Through the project-based approach, students will develop critical skills that are essential for success in Higher Education and the workplace, with projects tailored to their individual aspirations and goals.

## HIGHER EDUCATION AND CAREER OPPORTUNITIES

Studying Computer Science opens doors to a range of exciting career paths, such as Software Engineering, Game Development, Forensic Computing, Artificial Intelligence, and Information Systems. Careers in tech continue to grow and evolve, offering numerous opportunities, including:

- Expanding industries based on artificial intelligence, automation, and robotics.
- The increasing digital transformation of traditional industries.
- A strong drive to increase female representation in tech, where women currently make up only 7% of the workforce.

A-level Computer Science prepares Maynard students for these in-demand careers, ensuring they have the technical and analytical skills needed for success.

## COURSE CONTENT

Exam Board: OCR

### COMPUTER SYSTEMS

This component introduces students to the inner workings of the Central Processing Unit (CPU), data exchange, software development, and the legal and ethical issues surrounding technology. The foundational knowledge gained is essential for computational thinking and programming skills.

### ALGORITHMS AND PROGRAMMING

Building on the Computer Systems component, students will:

- Master computational thinking and apply it to a wide range of problems.
- Learn the principles of solving problems using computational methods.
- Use algorithms to break down and analyse complex problems.

### PROGRAMMING PROJECT

In this practical project, students will analyse, design, develop, test, evaluate, and document a program in a suitable programming language. They will apply computational thinking principles and an agile development approach to solve a real-world coding challenge.



MADE FOR GIRLS AGE 4 - 18

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