A Level Computer Science

Introduction

This course isn't just about using technology; it's about understanding and creating it. We'll explore the fundamental principles and logical thinking that power digital systems.
You'll develop essential computational thinking skills, including abstraction and algorithmic design. A core element is practical programming, where you'll apply theory to solve real-world problems by writing your own software.
We'll cover key areas like systems architecture, networks, data structures, and the ethical/legal aspects of computing. A significant independent programming project allows you to delve into a topic of your choice.

What will I learn?

You'll gain a comprehensive understanding of how computers and software function. You'll delve into computer systems, exploring the architecture of processors (like CPU, GPU), memory, input/output devices, and various storage technologies. You'll learn about different types of software (system and application) and modern software development methodologies.

A significant focus is on data, including its representation (binary), various data types, and fundamental data structures like arrays, queues, stacks, and trees. You'll master algorithms and programming, learning to design efficient solutions and implement them in code. This involves understanding sorting, searching, and graph traversal algorithms.

Furthermore, you'll study exchanging data, covering networks, compression, encryption, and database concepts. Crucially, the course addresses the legal, moral, cultural, and ethical issues surrounding computing, fostering responsible technological engagement. A major practical component is your independent programming project, allowing you to apply all learned skills to a real-world problem of your choice. This project can be about a dynamic 2D or 3D game, booking system to a mobile app or e-commerce website.

How will I be assessed?

Component	Type	Duration	Weight
Computer Systems (01)	Exam	2hrs 30mns	40%
Algorithms and programming (02)	Exam	2hrs 30mins	40%
Programming project (03)	NEA		20%

Key Points
All components are externally assessed

- Assessment includes a mix of:
- Short-answer questions
- Source analysis
- Algorithm questions
- Longer essay questions
- Mathematical questions

Opportunities

We regularly host guest speakers and leading academics in their fields of expertise. You will have the chance to attend lectures, events and theatre performances, especially those closely related to our areas of study. We arrange trips to Russell Group universities as well.

Other subjects?

Mathematics is crucial, often a university requirement, underpinning algorithms and logic. Physics , Economics and Design and Technology are also complementary subjects.

Future Careers

Potential career paths include Software Developer, Cybersecurity Analyst, Data Scientist, Web Developer, Network Engineer, and IT Consultant. You could also become a Games Developer, Machine Learning Engineer, or specialize in User Experience (UX) Design.

Course Information

Course Code - H446
Examination Board - OCR