

KS5 Curriculum : Computer Science

Curriculum Vision

OCR A Level Computer Science

The intent of our curriculum is to:

- Provide opportunities that allow all students, building on their prior knowledge and digital literacy, to understand and apply the fundamental principles and concepts of computer science, information technology and digital literacy.
- Expose students to a breadth of procedural and declarative knowledge across these three disciplines.
- Encourage students to analyse problems in computational terms and to have repeated practical experience of writing computer programs in order to solve problems.
- Provide new and repeated encounters with concepts in a variety of contexts to build a breadth and depth of knowledge.
- Encourage students to be critical and mindful of growth potential through evaluation and application of information technology, including new or unfamiliar technologies, analytically to solve problems.
- Equip students with the requisite technological and programming skills to prepare them for further study and future careers.

Curriculum Profile

Year 12

Autumn Term 1	Autumn Term 2
 Programming techniques: Programming basics. Selection. Iteration. Subroutines and recursion. Use of IDE. 	 Systems software: Functions of an operating system. Types of operating system. The nature of applications. Programming language translators.

Components of a computer:	Data structures:
Processor components.	• Arrays, tuples, records.
Processor performance.	Queues.
• Types of processor.	• Lists and linked lists.
Input devices.	• Stacks.
Output devices.	Hash tables.
Storage devices.	• Graphs.
	• Trees.

Spring Term 1	Spring Term 2
Software development:	Exchanging data:
• Systems and analysis methods.	Compression, encryption and
 Writing and following 	hashing.
algorithms.	 Database concepts.
 Programming paradigms. 	 Relational databases and
Assembly language.	normalisation.
	Introduction to SQL.
OOP:	 Defining and updating tables
Basics OOP.	using SQL.
OOP design principles.	
	Algorithms:
	 Analysis and design.
	Searching.
	• Bubble sort and insertion sort.

Summer Term 1	Summer Term 2
Non-examination assessment (NEA) project work.	Non-examination assessment (NEA) project work.
Revision for Year 12 school examinations.	Algorithms:Merge sort and quick sort.Graph traversal.Optimisation.

Please note that this timeline may be subject to change.

Assessment and Feedback

All students will:

• Have at least one piece of assessed work reviewed by their teacher per half-term (this increases to two pieces of assessed work if students receive five or more taught hours per fortnight).

• Receive feedback which outlines how they should develop their learning. This feedback should be summative, highlighting both key strengths and key areas for development in students' work.

• Be given the opportunity to act upon their feedback in a structured task. This task should then be reviewed again by the subject teacher. A review of this task can act as the second assessed task.

Resources to support learning beyond the classroom:

https://www.ocr.org.uk/images/170844-specification-accredited-a-level-gcecomputer-science-h446.pdf

https://www.pgonline.co.uk/resources/computer-science/a-levelocr/?tab=textbooks

https://isaaccomputerscience.org/login