Computer Science Curriculum Overview - Year 12

	Unit	Details
Autumn One	**Fundamentals of Programming** **Theory of Computation**	Pupils explore the fundamentals of programming in Python 3, revisiting sequence, selection and iteration pillars whilst exploring more complex data operations and procedures including regulation expression. In this unit pupils explore the logic behind computer science reviewing computational thinking and problem solving skills and learning how algorithms work.
Autumn Two	**Regular Languages** **Programming - Ai/Games design**	Pupils understand that a language is called regular if it can be represented by a regular expression. Also, a regular language is any language that a FSM will accept. Pupils explore the basic of Turing bots examining the basic principles behind concepts such as decision trees in Ai and Game Design
Spring One	**Data Structures** **Object Oriented Programming**	Pupils become familiar with the concept of data structures, by being able to distinguish between static and dynamic structures and compare their uses, as well as explaining the advantages and disadvantages of each. In this unit pupils explore the idea of Object Oriented Programming, examining how to utilise key concepts such instantiation, inheritance, polymorphism and composition can be used to create python programs.
Spring Two	**Algorithms** **Databases/SQL**	In this unit, pupils are able to trace and analyse the complexity of searching and sorting algorithms using Big-O Notation. Databases underpin the operations of programs, apps and websites across the tech sector, in this unit pupils explore their construction and how to utilise a database in a program.
Summer One	**Data Representation** **Internal Architecture**	Be familiar with the concept of computers using numbers to represent various forms of data, such as text, number, graphics and sound. In this unit, pupils explore the basic internal components of a computer system and understand the role of internal components and how they relate to each other
Summer Two	**Computer Hardware** **Communication Methods**	Pupils understand the relationship between hardware and software, focusing on the complexities of operating systems and different software classification. In this unit, pupils define serial and parallel transmission methods and discuss the advantages of serial over parallel transmission, specifically looking at key concepts such as baud rate, bit rate, bandwidth, latency and protocols.