

## KS4 Computing Curriculum Map

|         | Autumn Term  | Spring Term   | Summer Term  |
|---------|--|---|--|
| Year 10 | <p><b>Fundamentals of Computer Algorithms</b></p> <ul style="list-style-type: none"> <li>Algorithms, decomposition, abstraction</li> <li>Pseudo code and flowcharts</li> <li>Searching and Sorting Algorithms</li> <li>Bubble sort, merge sort</li> <li>Linear searches and Binary searches</li> </ul> <p><b>Programming</b></p> <ul style="list-style-type: none"> <li>Structured programming</li> <li>Practical programming using Python               <ul style="list-style-type: none"> <li>Variables</li> <li>Input and output</li> <li>Data types</li> <li>Selection</li> <li>Iteration – For and While loops</li> <li>Trace tables</li> <li>Relational operators</li> <li>String handling operations</li> <li>Subroutines</li> <li>Structured programming</li> <li>Reading and writing from files</li> <li>Data structures – lists and arrays</li> <li>Testing a program</li> </ul> </li> </ul> | <p><b>Fundamentals of data representation</b></p> <ul style="list-style-type: none"> <li>Converting between binary, denary and HEX</li> <li>Binary addition</li> <li>Unicode and ASCII</li> <li>Data representation of images</li> <li>Calculating file size of images</li> <li>Data representation of sound</li> </ul> <p>Recap on Python programming techniques (linking to data representation)</p> <p><b>NEA Computer Science Controlled Assessment</b></p> | <p><b>Fundamentals of data representation</b></p> <ul style="list-style-type: none"> <li>Units of computer storage</li> <li>Data compression</li> <li>Huffman coding</li> <li>Run Length Encoding</li> </ul> <p><b>Python programming</b></p> <ul style="list-style-type: none"> <li>Advanced Data structures</li> <li>String manipulation</li> <li>Dictionaries</li> <li>Using Functions</li> </ul> <p><b>Computer Systems</b></p> <ul style="list-style-type: none"> <li>Logic Gates – OR, AND, NOT, NOR and NAND</li> <li>Functions of operating system</li> <li>Role of the CPU</li> <li>Fetch, decode and Execute cycle</li> <li>Primary and Secondary Storage</li> <li>How magnetic and optical storage read and write data to disk</li> <li>Role of an operating system</li> <li>Applications and systems software</li> <li>Interpreters, compilers and assemblers</li> <li>High and low level programming languages</li> </ul> |
| Year 11 | <p><b>Fundamentals of Computer Networks</b></p> <ul style="list-style-type: none"> <li>Advantages and disadvantages of a computer network</li> <li>Network topologies – Star and bus</li> <li>Network protocols – HTTP, HTTPS, FTP, UDP, IMAP, SMTP</li> <li>Network Layer model</li> </ul> <p><b>Cyber Security</b></p> <ul style="list-style-type: none"> <li>Social Engineering</li> <li>Online threats</li> <li>Network security</li> </ul>  | <p><b>Ethical, environmental and legal aspects of computing</b></p> <p><b>Revision</b></p>  |  |