

## Key Stage 4 Curriculum – Carre’s Grammar School

<b>Subject</b>						
	<b>Autumn 1</b>	<b>Autumn 2</b>	<b>Spring 3</b>	<b>Spring 4</b>	<b>Summer 5</b>	<b>Summer 6</b>
<b>Year 10</b>	<p><b>Algorithms and Programming Techniques</b></p> <p>During this topic students will look at constructing algorithms using pseudocode and flowcharts as well as being able to identify key computational algorithms. Programming will be delivered alongside this topic to give students a practical opportunity to put theoretical algorithms into practice as well as develop key logical skills for future modules</p>	<p><b>Logic and Data Representation</b></p> <p>During this module, students will go through the mathematical element of the course, looking at aspects such as converting between denary, binary and hexadecimal values.</p> <p>Students will be studying the circuitry aspect of the course and applying these to trace tables to identify potential outputs given a set of inputs on a circuit.</p>	<p><b>Producing Robust programs and translators/facilities</b></p> <p>This module looks at making programs with security in mind such as login systems as well as more robust checking methods as well as identifying and preventing errors in coding.</p> <p>The facilities and translator’s aspect will look at the functionality offered by integrated development environments and how different programming languages are compiled.</p>	<p><b>Systems Architecture</b></p> <p>This module looks at the CPU in detail and what components make it up and how these small individual components work in tandem to translate binary numbers into instructions.</p> <p>The performance of computers is taught in this module where students will be able to identify how aspects such as additional cores or clock speed will impact the performance of a computer as well as the reason why.</p>	<p><b>Memory and Storage</b></p> <p>Aspects such as RAM and ROM are explored in this area and the differences between them as well as how different computer systems use them.</p> <p>Storage is explored in two aspects, the first being able to calculate storage sizes of files and the second aspect looking at the different types of storage and evaluating their usage based on factors such as cost, reliability, portability and speed.</p>	<p><b>Practical Programming Project</b></p> <p>As part of the J276 Computer Science qualification, all students are expected to undertake a 20-hour programming task.</p> <p>During this term students will be taught about project documentation and then be given the time to apply their prior learning of python skills in order to create a program that meets the exam boards brief.</p>
	<p><b>Assessment – Unit Tests for Algorithms (2.1) and Programming Techniques (2.2)</b></p>	<p><b>Assessment – Unit Tests for Data Representation (2.6) and Computational Logic (2.4)</b></p>	<p><b>Assessment – Unit Tests for Robust Programs (2.3) and Translators and facilities of languages (2.5)</b></p>	<p><b>Assessment – Mock Examination on Paper 2. Unit Test for Systems Architecture (1.1)</b></p>	<p><b>Assessment – Unit Test for Memory (1.2) and Storage (1.3)</b></p>	<p><b>Assessment - Practical Programming Project</b></p>
<b>Year 11</b>	<p><b>Networks and Protocols</b></p> <p>In this module, students will look at both wired and wireless networks, looking at both the differences as well as the suitability for these types of networks in different areas.</p> <p>Students will explore protocols and packet switching and see the various protocols that are used routinely in computer science.</p>	<p><b>Systems Security</b></p> <p>During this topic students will be taught about the various threats to a network and their impact. Students will also explore the steps a network administrator can take in order to reduce or nullify the risks posed to the network as well as the legal implications for failure to do so.</p>	<p><b>Systems Software and Ethical Issues</b></p> <p>In this module students will explore the different types of systems software available and be able to categorise them into distinct areas.</p> <p>Students will explore a range of ethical, legal, cultural and environmental issues that surround the future of computer science and be able to explain the impact that these can have.</p>	<p><b>Paper 1 Review – System Architecture, Memory and Storage</b></p> <p>To address any shortcomings from the lockdown – topics 1.1 – 1.3 will be re-taught and re-assessed to ensure any gaps in knowledge are addressed.</p>	<p><b>Revision</b></p> <p>During this time, students will be undertaking a range of revision-based activities including quick tests on each topic as well as mock tests.</p> <p>Examination reports will be explored to see the misconceptions that candidates have made on their exams as well as be able to see a range of model answers and their marks.</p>	<p><b>Study Leave</b></p>

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	<b>Assessment - Unit Tests for Wired and Wireless Networks (1.4) and Topologies, Protocols and Layers (1.5)</b>	<b>Assessment - Unit Tests for System Security (1.6) and Second Mock (Combined Paper 1 +2)</b>	<b>Assessment – Unit Tests for Systems Software (1.7) and Ethical, legal, cultural and environmental concerns (1.8)</b>	<b>Assessment – Past Paper Questions focused on areas where students are not yet confident.</b>		
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The course starts flipped with paper 2 being taught first, the reason for this is that the algorithm aspect of the course that features in 2.1 is not mutually exclusive to paper 2 and therefore by teaching these skills first it will allow students to approach paper 1 to the best of their ability without gaps in their knowledge.

Please note that the practical programming was assigned as a lockdown task and students have been given this as a project to complete by December 2020 with minimal in-class lessons provided as guidance, the expectation is for students to work on this project outside of class as an ongoing task and bring evidence in for the review lessons.