



Computer Science

OPTION - COMPUTER SCIENCE	Content
Year 10 HT 1	<p>Computer systems: Describe the role of the CPU. Explain the processes of the fetch-decode-execute cycle. Determine the role of main memory and secondary storage. Construct truth tables for three input logic circuits. Write a program using assembly language (LMC).</p> <p>Programming part 1 - Sequence: Determine the need for translators. Use sequence, variables, and input in Python. Design programs using a flowchart.</p>
Year 10 HT 2	<p>Computer systems (cont)</p> <p>Programming part 2 - Selection: Use randomisation in programs. Work with arithmetic and logical expressions. Use selection and nested selection in Python.</p>
Year 10 HT 3	<p>Algorithms part 1 - The essentials: Define the terms 'decomposition', 'abstraction', and 'algorithmic thinking'. Use trace tables</p> <p>Programming part 3 - Iteration: Use a while loop and a for loop in Python. Perform validation checks on data entry. Design programs using pseudocode</p> <p>Programming part 4 - Subroutines: Explain the differences between a procedure and a function. Describe scope of variables. Use functions and procedures as part of the structured approach to programming. Test a program for robustness.</p>
Year 10 HT 4	<p>Algorithms part 1 - The essentials (cont)</p> <p>Programming part 5 - Strings and lists: Define the term 'graphical user interface' (GUI). Perform string handling operations. Describe the differences between a list and an array. Manipulate a list. Work with 2D lists.</p>
Year 10 HT 5	<p>Data representations: Explain how numbers, text, images, and sound are represented using binary digits. Perform operations on binary digits. Convert between units of measurement.</p> <p>Programming part 5 -Strings and lists: Define the term 'graphical user interface' (GUI). Perform string handling operations. Describe the differences between a list and an array. Manipulate a list. Work with 2D lists.</p>
Year 10 HT 6	<p>Data representations (cont)</p> <p>Algorithms part 2 - Searching and sorting: Describe a linear and binary search. Explain the key algorithms for a bubble, merge, and insertion sort.</p>
Year 11 HT 1	<p>NEA Use a record and a dictionary data structure. Access and modify external data files. Complete a complex programming project</p> <p>Computer networks: Describe network components. Explain connectivity and distinguish between the various types. Describe the four layers of the TCP/IP model. Protect a network from threats.</p>
Year 11 HT 2	<p>NEA Cont</p> <p>Network security: Describe the various ways that users and organisations can be affected by cyberattacks. Demonstrate how organisations can prevent cyberattacks</p>
Year 11 HT 3	<p>NEA wrap up</p> <p>Impacts of technology: Determine the ethical, legal, environmental, and cultural impacts of technology.</p>
Year 11 HT 4	<p>Final Mock + targeted topic focus</p> <p>Databases and SQL: Describe a database and list its key terms. Determine the difference between a flat file and a relational database. Use structured query language (SQL) to retrieve and update data in a database.</p>
Year 11 HT 5	<p>Exam Prep</p> <p>Extension unit OOP: Define and apply the principles of object-oriented programming. Create a class in Python and use its attributes and methods.</p>