COMPUTER SCIENCE   YEAR 11

AUTUMN 1

2.2 Programming Fundamentals.
In this topic you will study. the use of variables, constants, operators, inputs, outputs and assignments. The use of the three basic programming constructs used to control the flow of a program: sequence, selection, Iteration (count and condition-controlled loops). The common arithmetic operators. The common Boolean operators AND, OR and NOT. The user of data types: Integer, Real, Boolean, Character and string, Casting. The use of basic string manipulation.

Prior Learning
Students will have been introduced to algorithms and flowcharts in KS3 and will take their understanding further by following, using and creating algorithms alongside text based programming.

AUTUMN 2

2.1 Algorithms.
In this topic you will study: Principles of computational thinking: Abstraction, Decomposition, Algorithmic thinking. Identify the inputs, processes, and outputs for a problem. Structure diagrams. You will create, interpret, correct, and refine algorithms using pseudocode, flowcharts, reference language/high-level programming language. Identify common errors. Trace tables. Standard searching algorithms: binary search, linear search. Standard sorting algorithms: bubble sort, merge sort, Insertion sort.

Prior Learning
Students will have been introduced to text based programming in KS3 and gained programming skills in year 10.

SPRING 1

2.3 Producing robust programs.
In this topic you will study. defensive design considerations; anticipating misuse; authentication; input validation, Maintainability: Use of sub programs, Naming conventions, Indentation, Commenting. The purpose of testing, Types of testing: Iterative, Final/terminal. Identify syntax and logic errors. Selecting and using suitable test data: Normal, Boundary, Invalid, and Erroneous. Refining algorithms.

Exam Revision Unit

Prior Learning
Students have programming in unit 2.2 and across KS3. Students will be now creating advanced programs that includes validation to ensure they are robust.

CHARACTER LINKS

Performance virtues of determination, motivation and perseverance are fostered through trial and error activities when accessing new information and skill.
Critical thinking and judgement traits (intellectual virtues) are cultivated in all units of work.

SPRING 2

2.3 Boolean logic.
In this topic you will study: simple logic diagrams using the operations AND, OR and NOT and truth tables. Combining Boolean operators using AND, OR and NOT to two levels. Applying logical operators in appropriate truth tables to solve problems.

2.5 Programming languages and Integrated.
In this topic you will study: characteristics and purpose of different levels of programming language. High-level languages and low-level languages.

Prior Learning
Students will have no prior knowledge of logic gates and will be introduced to the concept of how binary is stored and manipulated in a computer system. For 2.5, students will again reinforce their programming skills and understanding.

KEY ASSESSMENT DATES

Students complete and end of unit test for each unit studies, 2.1, 2.2, 2.3, 2.4, 2.5 (5 end of topic tests) the department also set separate mock assessments in accordance with the school assessment calendar.

SUMMER 1

Revision Paper 1 & 2

Prior Learning
This will allow the students to go back over all of paper 1/ 2 in order to revise for both papers.