Learning Programme

Fundamentals of Algorithms – AS Level

Topic/Content	Objectives/Skills	Homework	Assessment	Success Criteria	Stretch & Challenge (Thirst for Learning)
Simple graph-traversal algorithms	• Be able to trace breadth-first and depthfirst search algorithms and describe typical applications of both.	Topic Tests on traversing a tree or algorithm	Mock exams based on past papers	Grades based on previous years grade boundaries	Creation of bubble sort program using visual basic

Simple tree-traversal algorithms	• Be able to trace the tree-traversal algorithms:
	    ○ pre-order
	    ○ post-order
	    ○ in-order.
	• Be able to describe uses of tree-traversal algorithms.
		Topic tests and past papers			

Reverse Polish – infix transformations	• Be able to convert simple expressions in infix form to Reverse Polish notation (RPN) form and vice versa. Be aware of why and where it is used.	Text book questions and topic tests			
Searching algorithms					
Linear search	• Know and be able to trace and analyse the complexity of the linear search algorithm.	Trace table running through an algorithm			
Binary search	• Know and be able to trace and analyse the time complexity of the binary search algorithm.	See above			

Binary tree search	• Be able to trace and analyse the time complexity of the binary tree search algorithm.	See above			
Sorting algorithms					
Bubble sort	• Know and be able to trace and analyse the time complexity of the bubble sort algorithm.	Creation of a bubble sort program			
Merge sort	• Be able to trace and analyse the time complexity of the merge sort algorithm.	Trace table based on algorithm			
Optimisation algorithms					
Dijkstra's shortest path algorithm	• Understand and be able to trace Dijkstra's shortest path algorithm. • Be aware of applications of shortest path algorithm.	Trace/Truth table based on the travelling salesman problem			