Learning Programme

Fundamentals of programming – A Level

Topic/Content	Objectives/Skills	Homework	Assessment	Success Criteria	Stretch & Challenge (Thirst for Learning)
Programming			Students will be directed to create a program which includes recursion, encapsulation, polymorphism etc. Past paper questions also cover this section.	The created program works!	Students can make a simple example or a fully working model which includes inheritance. Past paper for the A'level it is essential that recursion is included and the last question of the exam usually distringuishes between an A or A* (8 or 9)
Role of stack frames in subroutine calls	• Be able to explain how a stack frame is used with subroutine calls to store: o return addresses o parameters o local variables.				
Recursive techniques	• Be familiar with the use of recursive techniques in programming languages (general and base cases and the mechanism for implementation). • Be able to solve simple problems using recursion.				
Programming paradigms					
Programming paradigms	• Understand the characteristics of the proceduraland object-oriented programming paradigms, and have experience of programming in each.				
Procedural-oriented programming	• Understand the structured approach to program design and construction.				

	• Be able to construct and use hierarchy charts when designing programs. • Be able to explain the advantages of the structured approach.				

Object-oriented programming	• Be familiar with the concepts of:
	  ○ class
	  ○ object
	  ○ instantiation
	  ○ encapsulation
	  ○ inheritance
	  ○ aggregation
	  ○ composition
	  ○ polymorphism
	  ○ overriding
	• Know why the object-oriented paradigm is used.
	• Be aware of the following object-oriented design principles:
	  ○ encapsulate what varies
	  ○ favour composition over inheritance
	  ○ program to interfaces, not implementation.
	• Be able to write object-oriented programs
	• Be able to draw and interpret class diagrams.				