BEAL SIXTH FORM

A LEVEL COMPUTER SCIENCE
Course Overview for Years 12 & 13

TERM	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
YEAR 12	**The characteristics of contemporary processors, input, output and storage devices** To introduce the concept of a **computer system** and its component parts and understand the link between **hardware** and **software**.		**Exchanging data** To understand how data can be stored in ***databases*** and transmitted over computer networks. To be able to explain the process of data ***compression*** and the use of ***protocols***.	**Network topologies and layers** To understand how ***data packets*** are transmitted between electronic devices and how they are encoded to enable their delivery.	**Progression exams** Component 01 and Component 02 style examinations.	**Elements of computational thinking** To understand the principles and elements of computational thinking, and to be able to identify ***abstraction***, ***decomposition***, ***logic*** and ***procedures*** to solve problems.
	Software and software development To develop programming skills in **Python**, Little Man Computer (**LMC**), **HTML**, **CSS**, **JavaScript** and **SQL** to be able to identify ***sequence***, ***selection*** and ***iteration*** in code. To simulate the operations of a processor and assembly language, create interactive web pages of a uniformed style, and query a database over the duration of the course.		**Data types, data structures and algorithms to solve problems and standard algorithms** To understand how data is represented within a computer and how ***binary*** can be interpreted as ***numbers***, ***text***, ***sound*** and ***images***. To be able to convert binary to ***hexadecimal*** and understand why this can be used as shorthand. To develop and review ***algorithms*** to complete standard tasks.			**Programming Project** To research and develop a programming project based on the analysis of a student lead project.
Assessed through	*Programming exercises, home learning tasks based on examination questions and end of unit tests.*	*Programming exercises, home learning tasks based on examination questions and end of unit tests.*	*Programming exercises, home learning tasks based on examination questions and end of unit tests.*	*Programming exercises, home learning tasks based on examination questions and end of unit tests.*	*Formal progression examinations.*	*Research and identify suitable project ideas.*

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TERM	AUTUMN 1		AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1
YEAR 13	**Databases** To develop and make the connection between database theory and their use as potential solutions to the ***Programming Project***. **Algorithms**		**Legal, moral, cultural and ethical issues** To explore the ***wider implications*** of the use of computers in the modern world and identifying the ***opportunities*** and ***risks*** it brings. This would include ***artificial intelligence***, ***environmental effects***, ***censorship***, ***personal data***, and ***piracy***. To understand and be able to apply relevant ***computer legislation*** to situations and explain how the principles of the law might be broken.		**Revision** To review and revise the entire examination specification.	**Examinations**
	Programming Project The students will develop a computing problem to work through according to the guidance in the specification based on the ***analysis***, ***design***, ***development***, ***testing*** and ***evaluation*** of their solution.					
Assessed through	*Completion of project work and home learning tasks.*	*Home learning tasks based on examination questions and revision tasks.*	*Formal Component 01 and Component 02 examination papers*	*Home learning tasks based on examination questions and classroom timed unit tests.*		