

Year 12 Subject Curriculum Overview by Term

Subject: Computer Science		Year Group: 12	AUTUMN TERM
Topic	Key Learning Points	Key Vocabulary	Assessments
Computational thinking & Programming techniques	<ul style="list-style-type: none"> Be able to explain low level languages Be able to explain high level languages Be able to describe a wide range of variable types Be able to describe what an IDE is Be able to effectively use an IDE Be able to use simple math functions in C# Be able to use selection within C# Be able to use iteration within C# Be able to use arrays within C# Be able to use Functions within C# Can explain the difference between a function and procedure Be able to plan and build simple programs in C# 	Abstraction Decomposition Caching Input Output Pre-conditions Procedures Sub-procedures Functions Concurrent processing Selection Iteration Array IDE Variable	Students will be assessed formatively through the completion of recall homework tasks along with a formal end of unit assessment completed under exam conditions. The assessment will be based on past paper questions. Testing on 60% of content from the unit just covered and 40% of all other topics covered in the subject to date.
Object Orientated Programming techniques & Unity	<ul style="list-style-type: none"> Be able to effectively debug code Be able to explain Object Orientated programming Be able to use classes in C# Be able to define inheritance Be able to define polymorphism Be able to define abstraction Be able to explain what are considered dangerous coding practices and why Be able to utilise the Unity game engine to produce simple 2D games 	Debugging OOP Classes Inheritance Polymorphism Abstraction Unity Visual studio Libraries	

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Subject: Computer Science		Year Group: 12	SPRING TERM
Topic	Key Learning Points	Key Vocabulary	Assessments
Software development & Algorithms	<ul style="list-style-type: none"> Be able to explain system analysis methods Be able to explain programming paradigms Be able to read and write LMC assembly language Be able to define big O notation Be able to explain binary search Be able to explain linear search Be able to explain bubble sort Be able to explain insertion sort Be able to explain merge sort Be able to explain quick sort Be able to carry out graph traversal Be able to explain A* search Be able to explain Dijkstra's 	Paradigms LMC Assembly language Big O notation Search algorithm Sort algorithm Binary search Linear search Bubble sort Insertion sort Merge sort Quick sort A* search Graph traversal Dijkstra's	Students will be assessed formatively through the completion of recall homework tasks along with a formal end of unit assessment completed under exam conditions. The assessment will be based on past paper questions. Testing on 60% of content from the unit just covered and 40% of all other topics covered in the subject to date.
NEA Introduction	<ul style="list-style-type: none"> Understand the rules and regulations of the NEA Have chosen a programming project for the NEA Have produced an outline document for the NEA written element Have started to produce the coded element for the NEA 	NEA	
Data types & structures	<ul style="list-style-type: none"> Be able to convert to and from binary Be able to convert to and from Hex Be able to explain ASCII Be able to explain UNICODE Be able to carry out binary arithmetic Be able to carry out floating point calculations Be able to explain the difference between lists, queues, and stacks Be able to explain hash tables 	Binary Hex ASCII UNICODE Floating point Lists Queues Stacks Hash tables	

Year 12 Subject Curriculum Overview by Term

Subject: Computer Science		Year Group: 12	SUMMER TERM
Topic	Key Learning Points	Key Vocabulary	Assessments
Components of a computer	<ul style="list-style-type: none"> Be able to explain all the internal components of a CPU Be able to explain the FDE Be able to explain the factors that affect processor performance Be able to explain various types of processors Can explain a range of input devices Can explain a range of output devices Can compare and contrast a range of storage devices 	CPU MAR MDR Registers PC ACC Bus FDE cycle	Students will be assessed formatively through the completion of recall homework tasks along with a formal end of unit assessment completed under exam conditions. The assessment will be based on past paper questions. Testing on 60% of content from the unit just covered and 40% of all other topics covered in the subject to date.
Systems software	<ul style="list-style-type: none"> Be able to describe the functions of an OS Able to explain a range of processor scheduling methods Able to explain a range of OS types Can explain the differences between open and closed source software Able to explain how code is translated for computers to be able to execute it 	OS Open source Closed source BIOS Drivers Scheduling Interrupts	
Legal, moral, ethical and cultural issues	<ul style="list-style-type: none"> Able to explain all the British laws that cover the use of computers Able to explain who Edward Snowden is Able to explain the impact the internet has and is having on the world Able to explain the impact computers are having in the workforce Able to discuss the ethical implication of AI within a range of life sectors Able to explain the impact of creating and disposing of computing devices Able to discuss censorship online Able to discuss privacy issues created by the internet 	Data protection act GDPR Copyright act Censorship Monitoring Artificial intelligence	

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How parents can support learning in the subject this academic year

Students can be supported at home by encouraging them to undertake programming projects on topics that interest them. That could be making mods for a game, or randomiser for what outfit to wear.

Recommended Reading

- Revision of theory topics covered - https://isaacomputerscience.org/topics/a_level?examBoard=all&stage=all#ocr
- Revision guides and questions of theory topics covered - <https://www.physicsandmathstutor.com/computer-science-revision/a-level-ocr/>
- C# concepts - <https://www.w3resource.com/csharp-exercises/>

Points to note

All students are provided with a “OCR AS and A-level Computer Science” revision guide at the start of the year 12, for them to take home for revision purposes. The last term of the year is used to recap the subject as a whole, and reteach any areas that the cohort as a whole underperform in that have been identified through assessment.