KS5 Curriculum Sequencing – Homework/Prep Time Work and Private Study Work: A Level Computer Science

A Level Computer Science homework, prep time work and private study work policy

All homework, prep time work and private study work in A Level Computer Science is set on Edulink homework with a clear set date, due date and time allocation.

Homework	3-4 hours of homework will be set for each student across both sides of the course every fortnight. This can vary in terms of weighting between the two sides of the course with two teachers. Homework will be checked for completion in future lessons.
Prep time work	2-3 hours of prep time work will be set per fortnight. Prep time work largely involves reading text book material, but also includes watching videos, progressing through interactive courses and note taking. This is with the aim of supporting learning in upcoming topics. Prep time work will be checked for completion periodically in future lessons. External VLEs such as Khan Academy are also used to monitor the amount of prep time work being completed by students.
Private study work	2-3 hours of private study work will be set each fortnight across both sides of the course. This includes reading articles, watching videos, progressing through interactive courses and note taking. Private study work is not checked for completion but evidence of completion will show through classwork and assessments.

Sequencing of homework, prep time work and private study work

Teacher A – Computer Systems

YEAR 12		
Term	**Unit**	**Independent Learning**
	1.1.3 Input, output and storage (3.5 hrs)	**Homework (1.5hrs)** Watch the following Videos. Formulate questions with answers about the content covered. The questions will be used to test the understanding of other members of the class. I/O, RAM/ROM & Virtual Storage https://www.youtube.com/watch?v=zzyCGHfuqe8&list=PLCiOXwirraUCQZhirOWfj3ZnkxBnSpq6w&index=2 https://www.youtube.com/watch?v=yhDmlhc_2_M&list=PLCiOXwirraUCQZhirOWfj3ZnkxBnSpq6w&index=3 https://www.youtube.com/watch?v=fmWr7gTxErA&list=PLCiOXwirraUCQZhirOWfj3ZnkxBnSpq6w&index=4 https://student.craigndave.org/videos/ocr-alevel-slr04-paging-segmentation-and-virtual-memory

		Independent Study 1.1.3 Input, output and storage Revision Questions
	1.1.1 Structure and function of the processor (4.5 hrs)	**Homework (1.5hrs)** Complete the lesson worksheets. GPU Read the GPU Article (Extended Reading) **Prep Work (1.5hrs)** Function & Structure of Processors https://www.youtube.com/watch?v=dVi2B7fGVm4&list=PLCiOXwirraUB7V2i0SJ4SSJFqRV_LtgzW https://www.youtube.com/watch?v=Y4O2-ilSw-o&list=PLCiOXwirraUB7V2i0SJ4SSJFqRV_LtgzW&index=2 https://www.youtube.com/watch?v=gVOtmMS17tI&list=PLCiOXwirraUB7V2i0SJ4SSJFqRV_LtgzW&index=5 **Independent Study (2.5hrs)** Structure and Function of CPU Questions Revision Read through the word documents. Answer the questions on the sheets. 1.1.1 Structure and function of Processors Exam Revision Questions
	1.2.1 Systems Software (5 hrs)	**Homework (3.5hrs)** Watch the Paging, Segmentation and Virtual Memory Video. https://student.craigndave.org/videos/ocr-alevel-slr04-paging-segmentation-and-virtual-memory System software Questions Isaac Computers https://isaaccomputerscience.org/gameboards#ffce8349-dacc-4aac-a434-bbc6c51eaebf Spooling Research and explain the following: What is spooling and why is it used? Describe spooling in the context of printing and explain why it is used. Bios Read the following and add your notes https://computer.howstuffworks.com/bios.htm Complete Worksheets **Prep Work (1.5hrs)** Watch the videos using the link provided, pausing and re-watching as required. Make notes of key points you have learnt. https://student.craigndave.org/videos/ocr-alevel-slr04-device-drivers https://student.craigndave.org/videos/ocr-alevel-slr04-types-of-operating-system https://student.craigndave.org/videos/ocr-alevel-slr04-bios https://student.craigndave.org/videos/ocr-alevel-slr04-virtual-machines **Independent Study (2hrs)** 1.2.1 System Software Revision Questions

	1.4.2 Data Structures (4.5 hrs)	**Homework (1hrs)** Hash Functions Article (Extended Reading) https://en.wikipedia.org/wiki/Cryptographic_hash_function Hash Functions Video https://youtu.be/b4b8ktEV4Bg **Prep Work (1.5hrs)** Watch the videos using the link provided, pausing and re-watching as required. Make notes of key points you have learnt. https://student.craigndave.org/videos/ocr-alevel-slr14-data-structures-part-2-graphs https://student.craigndave.org/videos/ocr-alevel-slr14-data-structures-ctar-part-2-graphs **Independent Study (2hrs)** 1.4.2 Data Structures Revision Questions
2	1.2.2 Applications Generation (5 hrs)	**Homework (1.5hrs)** Complete worksheets **Prep Work (1.5hrs)** Watch the videos using the link provided, pausing and re-watching as required. Make notes of key points you have learnt. Comparing C to machine code https://www.youtube.com/watch?v=yOyaJXpAYZQ Compilers and Programming Languages https://www.youtube.com/watch?v=QXjU9qTsYCc **Independent Study (2hrs)** 1.2.2 Applications Generation Revision Questions
	1.4.1 Data Types (4 hrs)	**Homework (2hrs)** 2D Array Revision (from GCSE) **Prep Work** **Independent Study (2hrs)** 1.4.1 Data Types Revision Questions
	1.4.3 Boolean Algebra (5 hrs)	**Homework (1.5hrs)** Isaac Computers Simplification Game Board https://isaaccomputerscience.org/assignment/simplification_may_2021 Isaac Computer Boolean Expressions Game Board https://isaaccomputerscience.org/assignment/boolean_expressions_may_2021 **Prep Work (1.5hrs)** Watch the videos using the link provided, pausing and re-watching as required. Make notes of key points you have learnt. Rule of Simplification https://youtu.be/43MVorZRtE0 Karnaugh Maps **https://youtu.be/gT9LdBr5DbU** **https://youtu.be/D_eHFX0Hz0g** **https://youtu.be/Es7kiAydcAM** **https://youtu.be/4q6Zwf4tK34** **Independent Study (2hrs)** 1.4.3 Boolean Algebra Revision Questions
3	1.3.1 Compression, Encryption and Hashing	**Homework (1.5hrs)** Complete the A level Encryption and the A level Compression Assignments set in Isaac Computing. https://isaaccomputerscience.org/account?authToken=VTNTTZ

	(3 hrs)	Research - What is PKI in terms of Asymmetric Encryption and how does it work? Read the Symmetric Encryption and Asymmetric Encryption Articles. **Independent Study (2hrs)** 1.3.1 Compression, Encryption and Hashing Revision Questions
	1.3.3 Networks (10.5 hrs)	**IPE REVISION (5hrs)** **Homework (1.5hrs)** Choice of Networks Factors Homework (1hr) **Prep Work (2hrs)** Watch the videos using the link provided, pausing and re-watching as required. Make notes of key points you have learnt. https://student.craigndave.org/videos/ocr-alevel-slr11-network-characteristics-protocols https://student.craigndave.org/videos/ocr-alevel-slr11-tcp-ip-dns-protocol-layers https://student.craigndave.org/videos/ocr-alevel-slr11-lans-wans https://student.craigndave.org/videos/ocr-alevel-slr11-client-sever-peer-to-peer https://student.craigndave.org/videos/ocr-alevel-slr11-packet-circuit-switching https://student.craigndave.org/videos/ocr-alevel-slr11-network-security-threats https://student.craigndave.org/videos/ocr-alevel-slr11-network-hardware **Independent Study (2hrs)** 1.3.3 Networks Revision Questions Data Transmission Error Checking Document – Beyond the Curriculum (Extended Reading) Cyber Security Article **https://www.bbc.co.uk/news/technology-39896393** (Extended Reading)

YEAR 13			
Term	**Hours**	**Unit**	**Independent Learning**
		NEA Design of the solution (8 Hours)	**Coursework** NEA Design Documentation **Prep Time Work** Text book reading – PG Online Tackling A Level projects in Computer Science Chapter 5: The design
		Algorithms (8 Hours)	**Homework** Khan Academy Algorithms Modules Big-O Practice exercises **Private Study** Harvard CS50 Lecture – Algorithms https://www.youtube.com/watch?v=gR6nycuZKlM&list=PLhQjrBD2T382_R182iC2gNZI9HzWFMC_8&index=4&ab_channel=CS50
		NEA Developing the solution (8 Hours)	**Coursework** NEA Development Documentation **Prep Time Work** Text book reading – PG Online Tackling A Level projects in Computer Science Chapter 6: Software development

2	NEA Developing the solution (8 Hours)	**Coursework** NEA Development Documentation **Prep Time Work** Text book reading – PG Online Tackling A Level projects in Computer Science Chapter 6: Software development
	NEA Evaluation (4 Hours)	**Coursework** NEA Evaluation Documentation **Prep Time Work** Text book reading – PG Online Tackling A Level projects in Computer Science Chapter 7: Evaluation Chapter 8: Final checks
	Computational Methods (8 Hours)	**Homework** High-mark Exam questions **Prep Time Work** Text book reading – PG Online (Chapter 50 and Chapter 51) **Private Study** Geeks for Geeks – Backtracking Introduction https://www.geeksforgeeks.org/backtracking-introduction IBM – Guide to Data Mining https://www.ibm.com/cloud/learn/data-mining How the data mining of failure could teach us the secrets of success https://www.technologyreview.com/2019/03/29/136273/data-mining-reveals-the-hidden-secret-of-human-failure-and-how-to-turn-it-into-success/

Teacher B – Algorithms and Programming

YEAR 12		
Term	**Unit**	**Independent Learning**
1	Software Development and Basic Programming Techniques (14 Hours)	**Homework** Features of an IDE – Intro to Visual Studio in 5 minutes https://www.youtube.com/watch?v=5AOp8zFu4Vg Complete Programming Modules – Allocated from through MS Learn https://docs.microsoft.com/en-gb/learn **Prep Time Work** Text book reading – PG Online **Private Study** Independent Programming Tasks – Complete a programming journal https://www.w3schools.com/cs/index.php https://www.ocr.org.uk/Images/260930-coding-challenges-booklet.pdf https://projecteuler.net
	Programming with Basic Data Structures (6 Hours)	**Homework** Complete Programming Modules – Allocated from through MS Learn https://docs.microsoft.com/en-gb/learn Battleships Structured Programming Project **Private Study** Harvard CS50 Lecture – Data Structures https://www.youtube.com/watch?v=2T-A_GFuoTo&list=PLhQjrBD2T382_R182iC2gNZI9HzWFMC_8&index=7&ab_channel=CS50

	Introduction to Computational Thinking (10 Hours)	**Homework** Case Study Project – How computational thinking has changed professional sports (Based on the book Moneyball: The Art of Winning an Unfair Game) **Prep Time Work** Text book reading – Hodder (Chapter 1 – Computational Thinking) **Private Study** Computational Thinking (with Jeannette Wing) https://www.youtube.com/watch?v=V9Xy18YEK9M&ab_channel=MicrosoftResearch Computational Thinking & Scratch - Intro to Computer Science - Harvard's CS50 (2018) https://www.youtube.com/watch?v=F0WoVEr0-44&ab_channel=freeCodeCamp.org
2	Advanced Programming Techniques (12 Hours)	**Homework** Complete Programming Modules – Allocated from through MS Learn https://docs.microsoft.com/en-gb/learn Monster! Structured Programming Project **Prep Time Work** Text book reading – PG Online (Chapter 13 – Programming paradigms) **Private Study** Independent Programming Tasks – Complete a programming journal https://www.w3schools.com/cs/index.php https://www.ocr.org.uk/Images/260930-coding-challenges-booklet.pdf https://projecteuler.net
	Computational Thinking to Support Advanced Programming (8 Hours)	**Homework** Plant Growing Simulation Structured Programming Project NEA Idea Generation **Private Study** The Art of Abstraction – Computerphile https://www.youtube.com/watch?v=p7nGcY73epw&ab_channel=Computerphile Visitas Thinks Big 2016 - Abstraction by Professor David J. Malan https://www.youtube.com/watch?v=6V1sr0XV_Ng&ab_channel=CS50
3	Web Technologies (8 Hours)	**Homework** Khan Academy HTML/CSS Modules NEA Proposal **Private Study** Harvard CS50 Lecture – HTML, CSS and JavaScript https://www.youtube.com/watch?v=5g0x2xv3aHU&list=PLhQjrBD2T382_R182iC2gNZI9HzWFMC_8&index=10&ab_channel=CS50
	Databases (8 Hours)	**Homework** Khan Academy SQL Modules Normalisation practice exercises
	NEA Analysis of the problem (8 Hours)	**Coursework** NEA Analysis Documentation **Prep Time Work** Text book reading – PG Online Tackling A Level projects in Computer Science (Chapters 1 to 4) **Private Study** Indie Game Development Pipeline – Essential for game-based NEAs **https://learn.unity.com/project/case-study-the-first-tree**

YEAR 13			
Term	**Hours**	**Unit**	**Independent Learning**
1		NEA Design of the solution (8 Hours)	**Coursework** NEA Design Documentation **Prep Time Work** Text book reading – PG Online Tackling A Level projects in Computer Science Chapter 5: The design
		Algorithms (8 Hours)	**Homework** Khan Academy Algorithms Modules Big-O Practice exercises **Private Study** Harvard CS50 Lecture – Algorithms https://www.youtube.com/watch?v=gR6nycuZKlM&list=PLhQjrBD2T382_R182iC2gNZI9HzWFMC_8&index=4&ab_channel=CS50

	NEA Developing the solution (8 Hours)	**Coursework** NEA Development Documentation **Prep Time Work** Text book reading – PG Online Tackling A Level projects in Computer Science Chapter 6: Software development
2	NEA Developing the solution (8 Hours)	**Coursework** NEA Development Documentation **Prep Time Work** Text book reading – PG Online Tackling A Level projects in Computer Science Chapter 6: Software development
	NEA Evaluation (4 Hours)	**Coursework** NEA Evaluation Documentation **Prep Time Work** Text book reading – PG Online Tackling A Level projects in Computer Science Chapter 7: Evaluation Chapter 8: Final checks
	Computational Methods (8 Hours)	**Homework** High-mark Exam questions **Prep Time Work** Text book reading – PG Online (Chapter 50 and Chapter 51) **Private Study** Geeks for Geeks – Backtracking Introduction https://www.geeksforgeeks.org/backtracking-introduction IBM – Guide to Data Mining https://www.ibm.com/cloud/learn/data-mining How the data mining of failure could teach us the secrets of success https://www.technologyreview.com/2019/03/29/136273/data-mining-reveals-the-hidden-secret-of-human-failure-and-how-to-turn-it-into-success/