|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year 12 Term 2**  **A Level Computer Science** | Our mission is to stimulate and challenge our students to excel and provide a desire for lifelong learning and pursue careers in the world of Business, Computing, and ICT. | | | | | |
| **Enquiry Questions: If the OS schedules tasks to be executed, is it really multitasking? Or is it a delusion of sequencing? Can you compress a compressed file? Would it be uncompressed the same way?** | | | | | | |
| |  | | --- | | **Component 01: Computer Systems**  This component will introduce learners to the internal workings of the Central Processing Unit (CPU), the exchange of data and will also look at software development, data types and legal and ethical issues. It is expected that learners will draw on this underpinning content when studying computational thinking, developing programming techniques and devising their own programming approach in the Programming project component (03 or 04). Learners will be expected to apply the criteria below in different contexts including current and future uses of the technologies. | | | | | | | |
| **Knowledge**  Students will know about… | **Application/Skills**  Students will be able to… | **Vocabulary** | **Home Learning** | **Assessment** | **Extra Resources**  **Extended Reading** | **Cultural Capital** |
| **1.2 Types of software and software development**  **1.2.1 Operating System**  Students in this unit will understand the purpose of an Operating System and its features. They will get a deeper understanding of what an OS manages and how it schedules tasks efficiently. Students will also explore extra features of a computer system such as BIOS and VM’s.  **1.2.2 Applications Generation**  This unit consists of understanding the various types of applications and the steps in how software is compiled and executed.  **1.2.3 Software development**  This is a brief unit in which students understand software life cycles during development.  **1.3 Exchanging data**  **1.3.1 Compression & Encryption**  Learning compression techniques on data and understand the benefits and consequences of certain file types and compression methods. | * State the function and purpose of an operating system * Describe scheduling algorithms: round robin, first come first served, multi-level feedback queues, shortest job first and shortest remaining time * Describe distributed, embedded, multi-tasking, multi-user and real-time operating systems * Describe the function of BIOS and device drivers * Distinguish between systems software and applications software * Describe what is meant by a utility program and give examples * Be able to justify a suitable application for a specific purpose * Distinguish between open source and closed source software * State the roles of an assembler, compiler and interpreter * Describe the use of libraries * Describe the role of an Interrupt Service Routine (ISR) within the fetch-decode-execute cycle * Explain why an intermediate language such as bytecode is produced as the final output by some compilers and how it is subsequently used | * Purpose of an operating system * Memory Management * Interrupts and Polling * Scheduling * Types of operating systems * BIOS * Device Drivers * Virtual Machines * Types of applications and utilities * Applications generation Program creation * Stages of compilation * Linkers Loaders & Libraries * Little Man Computer (LMC) * Memory Modes * Lossy compression * Lossless compression * Dictionary compression * Run Length encoding * Huffman encoding * Symmetric encryption * Asymmetric encryption | High quality Homework set on Google Classrooms  Teach-ICT.com  PG Online – ClearRevise A Level Computer Science | End of unit assessments via Socrative  In-class mock exams | [Teach-ICT.com](https://teach-ict.com/2016/GCSE_Computing/OCR_J277/OCR_J277_home.html)  [Isaac Computer Science](https://isaaccomputerscience.org/topics/gcse?examBoard=all&stage=all#all)  Seneca – [Computer Science](https://app.senecalearning.com/classroom/course/a1ce4570-6e27-11e8-af4b-35cf52f905c2/section/65ac2e24-3b57-4598-b4dc-01e04eddee1b/session)  BBC Bitesize  Hodder Education – Revision Book A Level Computer Science | The National Science Museum (free events)  <https://www.sciencemuseum.org.uk/>  The Royal Institute of Science (free events)  <https://www.rigb.org/families/family-fun-days>  **National Museum of Computing, Bletchley Park (Near Milton Keynes)**  <http://www.tnmoc.org/>    <https://www.bletchleypark.org.uk/>  <http://www.codesandciphers.org.uk/bletchleypark/>  (virtual tour)    Centre for Computing History, Cambridge  <http://www.computinghistory.org.uk/> |