



YEAR 12 A LEVEL COMPUTER SCIENCE AUTUMN 2nd TERM 1 – PAPER 1

‘An ambitious curriculum that meets the needs of all’

Medium Term Planning – Systems Software and Application Generation

Curriculum Intent	Pupils will be taught the following National Curriculum guidelines this term:
Skills/Assessment Objective Links	<p>At the end of this Unit all students should be able to:</p> <ul style="list-style-type: none">▪ 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 <p>Most students will be able to:</p> <ul style="list-style-type: none">▪ Describe memory management (paging, segmentation and virtual memory)▪ Describe the role of interrupts▪ Describe the need for processor scheduling algorithms▪ Explain the difference between compilation and interpretation, and describe situations when both would be appropriate▪ Describe what is meant by a virtual machine▪ Describe the stages of compilation: lexical analysis, syntax analysis, code generation and optimisation▪ Describe the function of linkers and loaders <p>Some students will be able to:</p> <ul style="list-style-type: none">▪ 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
Numeracy	Time slice
Literacy	<p>Vocabulary Tier 3: Operating System (OS), Read Only Memory (ROM), paging, segmentation, Random Access Memory (RAM), contiguous, virtual memory, disk thrashing, interrupt, scheduling algorithm, stack, time slice, distributed, embedded, failsafe, redundancy, BIOS, driver, virtual machine, utility software, disk defragmenter, heuristics, library, translator, bespoke, proprietary assembler, compiler, interpreter, bytecode, lexical analysis, syntax analysis, parsing, symbol table, semantic analysis, linker, loader.</p> <p>Vocabulary Tier 2: memory, disk, random, symbols, software, virtual</p> <p>Reading: Worksheets, presentations, answer sheets, exam questions, mark scheme, further reading for homework</p> <p>Writing: Answer on the worksheet via word</p> <p>Oracy: listening and using tier 3 words</p>
Becoming future ready	<p>Careers/Employability:</p> <p>Understand the grade requirements at universities and the topics that can be applied for. Explore apprenticeship opportunities with a range of industries.</p> <ul style="list-style-type: none">▪ Software Architect.▪ Data Scientist.▪ Machine Learning Engineer.▪ Blockchain Developer▪ Cybersecurity Engineer.

	<ul style="list-style-type: none"> Cloud Solutions Architect. AI Research Scientist. Full-Stack Developer.
Adaptation	Throughout this topic, quality first teaching will provide differentiation:
QFT/SEND Provision	<p>By product: Learners are asked to present outcomes in a different way via pieces of writing, targeted questioning, models and drawings and speaking.</p> <p>By resource: Worksheets are well presented and accessible. Instructions are clearly outlined and separate from the information so that pupils know where to begin and end. Handouts are differentiated by outcome. Resources used will appeal to the range of preferred learning styles of pupils e.g. visual, auditory or kinesthetic learners. Scaffolding of tasks – word frames.</p> <p>By Intervention: By providing different levels of supervision and support</p> <p>By Progressive Questioning: Exploring pupils' understanding through interactive dialogue using Blooms Taxonomy.</p> <p>By Grouping: According to prior attainment, gender, social preference, preferred learning style.</p> <p>By Task: Pupils identify targets which are meaningful to them via feedback sheets</p> <p>By Offering Optional Activities: In class or as homework, to extend learning.</p> <p>This QFT/SEND provision will be explicit within the lesson by lesson schemes of work.</p>
Implementation Curriculum Delivery	To be able to:
Learning Outcomes (Knowledge)	<p>Topic 1 Function and purpose of an operating system Understand the function and purpose of an operating system Describe memory management, interrupts, scheduling routines Describe the role of interrupts and an Interrupt Service Routine (ISR) within the fetch-decode-execute cycle Describe the need for processor scheduling algorithms Describe scheduling algorithms: round robin, first come first served, multi-level feedback queues, shortest job first and shortest remaining time</p> <p>Topic 2 Types of operating Describe distributed, embedded, multi-tasking, multi-user and real-time operating systems Describe BIOS, device drivers and virtual machines</p> <p>Topic 3 Nature of applications 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</p> <p>Topic 4 Programming language translators Understand the role of an assembler, compiler and interpreter Explain the difference between compilation and interpretation, and describe situations when both would be appropriate Explain why an intermediate language such as bytecode is produced as the final output by some compilers and how it is subsequently used Describe the stages of compilation: lexical analysis, syntax analysis, code generation and optimisation Describe the function of linkers and loaders Describe the use of libraries</p> <p>End of unit assessment</p>
Current learning to be developed in the future within:	
Assessment	See assessment maps for formative and summative assessment opportunities.
Impact	Review assessment results and target pupils that require further support via:-

- Learning conversation
- Changing seating plan
- Plan lessons to address areas of concern in assessment
- Targeted homework based on low performance areas identified in the assessor marked pieces
- Stretch and challenge high ability pupils by identifying ambitious next steps to expand knowledge



Create a feedback sheet for each student

Each student identifies areas of Green, Amber and Red using Mark Assessment on their feedback sheet

Complete NOW task on areas identified as Amber and Red