IT & Computer Science – Curriculum Sequence Grids

Year 12 CS OCR A-Level H446	Term 1	Term 2	Term 3
Unit(s) – As outlined in 39 week plans	• Input, output and storage • Thinking abstractly • Thinking ahead • Thinking procedurally • Structure and function of the processor • Thinking logically • Thinking concurrently • Types of processor • Programming techniques • Systems software • Applications generation • Types of programming languages • Software development • Computational methods	• Data representation • Data structures • Boolean algebra • Algorithms • Compression, encryption and hashing • Databases • Networks • Moral and ethical issues	• Web technologies • Computing related legislation • Programming • Revision, past paper and exam techniques • Previous programming projects
Key Retainable Knowledge & Skills	Different types of storage and memory. CPU components (Von Neumann) and roles. The purpose of the operating system and other types of software. Programming techniques. Coding using two dimensional arrays. Assembly languages. Basic Python skills.	Binary, addition, conversion and how it is used to represent text, graphics and sounds. Data structures and manipulation. Writing and following algorithms. Searching and sorting algorithms. How files are compressed. How databases work. Networks and protocols. Moral and ethical issues relating to AI/computer use and the disposal of electronics.	Web technologies. GDPR/Computer Misuse Act/ Data Protection Act/Copyright and Patents Act/Regulation of Investigatory Powers Act. Additional programming skills.
Key Technical Vocabulary	• Magnetic, flash, optical and virtual storage • Ram and Rom • Algorithm • Integrated development environment	• Arrays • Traverse • Waterfall lifecycle, methodologies • Boolean	• Lossy, lossless, RLE. • Symmetric and asymmetric encryption. • Relational database, normalisation to 3NF, SQL, referential integrity, transaction

	• ALU, CU, registers, PC, ACC, MAR, MDR, CIR • Fetch-decode-execute • Sequence, selection, iteration, branching • Procedural • Recursion • ASCII, UNICODE • Segmentation • Interrupts • Scheduling • Round Robin • Linkers and loaders • Backtracking • Data mining • Heuristics • Pipelining • Lexical Analysis	• Stacks, queues, trees, linked lists. • Bubble sort, insertion sort, merge sort, quick sort, Dijkstra's shortest path, A* algorithm, binary search and linear search. • OOL • CISC and RISC • Multicore and parallel systems	processing, ACID, record locking, and data redundancy. • TCP/IP, protocols, packet and circuit switching. • Data Protection Act • Computer Misuse Act • Copyright and Patents Act • Regulation of Investigatory Powers Act
Opportunities for Reading	Exam board and 'Craig 'n' Dave' documentation. Python tips https://www.csnewbs.com/python We have a dozen Computer Science text books in G15 that students can refer to. Some of the students may have their own from Y11 too.	Exam board and 'Craig 'n' Dave' documentation. Python tips https://www.csnewbs.com/python We have a dozen Computer Science text books in G15 that students can refer to. Some of the students may have their own from Y11 too.	Exam board and 'Craig 'n' Dave' documentation. Python tips https://www.csnewbs.com/python We have a dozen Computer Science text books in G15 that students can refer to. Some of the students may have their own from Y11 too.
Developing Cultural Capital	• Understanding how everyday computer systems work and the coding that goes on behind them. • An appreciation of how documentation is saved and compressed so it's suitable for sharing with others. • An appreciation as to the damage poor disposal of electronics do to the world. • A greater knowledge of how the computers across the world are connected and information is shared. • An understanding of legislation that must be followed and possible implications of breaking these.		
Cross Curricular Links (Authentic Connections)	• Maths – Mathematical approach to coding and the way in which computers work • Science – How computers are built and operate • PSE – Legislation and Health and Safety		

IT & Computer Science – Curriculum Sequence Grids

Key Assessment	Input, output and storage Computational thinking Programming techniques Software development	Data representation Algorithms Databases Networks	Exam questions Trial paper
Final assessment – 3 exams, 1 piece of coursework • Computer Systems (01) – 140 marks, 2hrs 30 mins, 40% • Algorithms and programming (02) – 140 marks, 2 hours and 30 mins 40% • Programming project – 70 marks, 20%			

IT & Computer Science – Curriculum Sequence Grids

Year 13 CS OCR A-Level H446	Term 1	Term 2	Term 3
Unit(s) – As outlined in 39 week plans	• Programming project – Analysis • Programming project – Design • Revision for trial exams	• Programming project – Development • Programming project – testing and evaluation • Revision for trial exams	• Revision for external exams
Key Retainable Knowledge & Skills	The focus of this half-term is the programming project. This is 20% of the course, students will design their project at this point. Skills for this will also be linked to the exams.	A good understanding of the requirements of the practical project and the ability to complete this effectively and accurately.	Recall from content covered over the past two years.
Key Technical Vocabulary	• Analysis • Problem identification • Stakeholders • Design	• Decomposition • Development • Testing • Evaluation	Recall from content covered over the past two years.
Opportunities for Reading	Exam board and 'Craig 'n' Dave' documentation. Python tips https://www.csnewbs.com/python We have a dozen Computer Science text books in G15 that students can refer to. Some of the students may have their own from Y11 too.	Exam board and 'Craig 'n' Dave' documentation. Python tips https://www.csnewbs.com/python We have a dozen Computer Science text books in G15 that students can refer to. Some of the students may have their own from Y11 too.	Exam board and 'Craig 'n' Dave' documentation. Python tips https://www.csnewbs.com/python We have a dozen Computer Science text books in G15 that students can refer to. Some of the students may have their own from Y11 too.
Developing Cultural Capital	• Understanding how everyday computer systems work and the coding that goes on behind them. • An appreciation of how documentation is saved and compressed so it's suitable for sharing with others. • An appreciation as to the damage poor disposal of electronics do to the world. • A greater knowledge of how the computers across the world are connected and information is shared. • An understanding of legislation that must be followed and possible implications of breaking these.		
Cross Curricular Links	• Maths – Mathematical approach to coding and the way in which computers work • Science – How computers are built and operate • PSE – Legislation and Health and Safety		

(Authentic Connections)			
Key Assessment	Programming project – Analysis Programming project – Design Trial papers	Programming project – Development Programming project – Testing and evaluation	External exams
Final assessment – 3 exams, 1 piece of coursework • Computer Systems (01) – 140 marks, 2hrs 30 mins, 40% • Algorithms and programming (02) – 140 marks, 2 hours and 30 mins 40% • Programming project – 70 marks, 20%			

IT & Computer Science – Curriculum Sequence Grids

Year 12 IT	Term 1	Term 2	Term 3
Unit(s) – As outlined in 39 week plans	• Unit 1 exam content	• **Unit 1 external exam** • Unit 2 exam content	• **Unit 2 external exam** • Coursework – Unit 17 IoE
Key Retainable Knowledge & Skills	Unit 1 exam topics: • LO1 – Understand computer hardware • LO2 – Understand computer software • LO3 – Understand business IT systems • LO4 – Understand employability and communication skills used in an IT environment • LO5 - Understand ethical and operational issues and threat to computer systems	Unit 2 exam topics: • LO1 – Understand where information is held globally and how it is transmitted • LO2 – Understand the styles, classification and the management of global information • LO3 – Understand the use of global information and the benefits to individuals and organisations • LO4 – Understand the legal and regulatory framework governing the storage and use of global information. • LO5 - Understand the process flow of information. • LO6 - Understand the principles of information security.	Unit 17 learning outcomes: • LO1 – Understand what is meant by the Internet of Everything (IoE) • LO2 – Be able to repurpose technologies to extend the scope of the IoE • LO3 – Be able to present concept ideas for repurposed developments
Key Technical Vocabulary	• Troubleshooting • Units of measurement • Binary/decimal/hexadecimal • Bespoke, shareware, freeware • Compiler, debugger, translator, IDE. • MIS • VoIP • Protocol (IP, TCO, UDP, SMTP, FTP, HTTP, SNMP, ICMP, POP) • Virtualisation • Non-verbal communication • Whistle blowing • Biometrics • RFID • Tokens	• Digital divide • Information classification • Data vs Information • Data set • Legislation • Carbon footprint • Digital footprint • Data-Flow-Diagram • Cloud storage • Biometrics • Firewall	• Internet of Everything • Four pillars of the IoE • Connectivity including Wi-Fi, Bluetooth • Business proposal and pitch • Stakeholder

	• Legislation		
Opportunities for Reading	Cambridge Technicals Level 3 IT text book. 'My Revision Notes' book on the Cambridge Technicals. https://www.csnewbs.com/ctech Revision site.	Cambridge Technicals Level 3 IT text book. 'My Revision Notes' book on the Cambridge Technicals. https://www.csnewbs.com/ctech Revision site.	Cambridge Technicals Level 3 IT text book. 'My Revision Notes' book on the Cambridge Technicals. https://www.csnewbs.com/ctech Revision site.
Developing Cultural Capital	A greater understanding of how computers are used in the workplace and ethical and moral implications of them being so. Job interview techniques.	The exam is scenario based and students have to explore how a fictitious company operates on a world wide scale. They focus on the capture, sharing, manipulation and processing of data and look at how it is done and legislation that must be followed.	
Cross Curricular Links (Authentic Connections)	Business Studies – The communication of data worldwide (Unit 2) and also a business style presentation and key business terminology for unit 17. Maths – Spreadsheets and databases. English – Strong SPAG skills required for the exam and coursework elements.		
Key Assessment	• Exam questions for each LO of Unit 1. • Preliminary exam – Done in class. • External exam for this unit is Monday 9th Jan 2023.	• Exam questions for each LO of Unit 2. • Preliminary exam – Done in class. • External exam for this unit in May 23.	Completion of the three parts of Unit 17 ready for moderation in Y13. This unit may roll on into Y13.

Final assessment – Two external exams (25% each) and three coursework units (totalling the other 50%) Each exam will be initially sat in Jan/May of Y12 and then potentially resat in January of Y13.

- Unit 1 exam – Fundamentals of IT – 90 mins, 80 marks.
- Unit 2 exam – Global Information – 90 mins, 80 marks.
- Unit 5 – AR/VR
- Unit 17 – Internet of Everything
- Unit 18 – Hardware

Graded at D* (A*), D (A), M (C), P (E)