Computing department - year 10 computer science scheme of work

Term	Title	Unit content	Key vocabulary
Autumn Week 1 - 5	Systems Architecture	1.1.1 Architecture of the CPU The purpose of the CPU	Processor, CPU, Instruction, Input/Output, Devices, Execute, Fetch, Decode, Storage
		Common CPU components and their function	Arithmetic Logic Unit, Control Unit, Registers, Accumulator
		Von Neumann Architecture	Memory Address Register, Memory Data Register, Program Counter, Cache, Fetch/Execute, Buses
		1.1.2 - CPU performance How common characteristics of CPUs affect their performance	MHz, GHz, Hertz, Instruction, Clock Speed, Core
		1.1.3 - Embedded systems The purpose and characteristic of embedded systems	Digital Device, Embedded system, Function, Microprocessor, RAM, ROM, UI (User Interface)
Autumn Week 6 - 10	Memory and Storage	1.2.1 – Primary storage (Memory) RAM and ROM	Primary Storage, CPU, RAM, ROM, Volatile, Non-Volatile, BIOS, Disk thrashing, Firmware
		Virtual Memory	Hard Disk, Disk thrashing/swapping, Portable, Internal, External, Secondary storage
		1.2.2 – Secondary storage Secondary storage devices	Optical, Magnetic, Solid State, Durability, Reliability, Portability, Capacity, Speed
		Secondary storage scenarios	Storage, Characteristic, Estimate, Overheads
		1.2.3 – Units Units	Bit, Nibble, Byte, Kilobyte, Megabyte, Gigabyte, Terabyte, Petabyte
		1.2.4 – Data storage Numbers	Binary, Hexadecimal, Denary
		Characters	ASCII, Unicode

		Sound	Digital Audio, Sample size/bit depth, Sample rate, Bit rate,
		1.2.5 – Compression Compression	Lossy vs Lossless
Autumn Week 11 - 15	Computer Networks, Connections, and Protocols	1.3.1 - Networks and topologies The purpose of networks. LANs and WANs	Network, LAN, WAN
		Network hardware and factors affecting network performance	Wireless Access Point (WAP), Router, Switch, Network Interface Card (NIC), Transmission Media
		Client-server and peer-to-peer networks	Client, Server, Peer
		The Internet	Internet, DNS, Hosting, The Cloud, Web Server, Client
		Network Topologies	Topology, Mesh Network, Star Network, Partial Mesh, Full Mesh
		1.3.2 – Wired and wireless networks, protocols and layers	Wired, Ethernet, Wi-Fi, Bluetooth
		IP, MAC and encryption	Media Access Control (MAC), IP Address, Encryption
Assessment point 1			

Term	Title	Unit content	Key vocabulary
Spring Week 1 - 4	Network Security	1.4.1- Threats to computer systems and networks Malware and social engineering	Malware, Viruses, Worms, Trojan Horses, Phishing, Social Engineering, Data Interception
		Brute force, DDOS and SQL injection	Brute force attacks, DoS, Botnet, Exploit, SQL Injection
		1.4.2 – Identifying and preventing vulnerabilities Penetration testing, anti-malware and firewalls	Penetration Testing, Anti-malware, Firewalls
		User access levels, passwords, encryption and physical security	User access levels, Passwords, Encryption, Cypher, Key
Spring Week 5 - 8	Systems Software	1.5.1 - Operating systems	Systems software, Operating System (OS), User Interface, Graphical User Interface, Command Line

			Interface, Memory Management, Data, Multitasking, Peripheral, Device Driver, User management, Access rights, File management
		1.5.2 - Utility software	Utility Program, Operating System, Encryption, Key, Interception, Defragmentation, Fragmentation, Hard Drive, Files, Data Compression, Lossy, Lossless
Spring Week 9 - 11	Ethical, Legal, Cultural, and Environmental Impacts of Digital Technology	1.6.1 – Ethical issues	Digital technology, Ethics, Principles, Professional bodies
		1.6.1 Cultural and environmental issues	Cultural, Character sets, Digital divide, Environmental
		1.6.1 Privacy and legal issues	Privacy, Legal issues, The Data Protection Act 1998, Computer Misuse Act 1990, Copyright Designs and Patents Act 1988
		1.6.1 DPA and CMA	Data Protection Act 2018, Personal details, Secure, Fair, Lawful, Adequate, Relevant, Accurate, Computer Misuse Act 1990, Unauthorised access, Modification, Hacking
		1.6.1 Copyright Designs and Patents Act 1988	Copyright Designs and Patents Act, Creator, Copy, Distribute, Licence
		1.6.1 Software licences	Open source, Proprietary, Source code, Compiled code, Bugs
Assessment point 2			

Term	Title	Unit content	Key vocabulary
Summer Week 1 - 7	Algorithms	2.1.1 – Computational thinking	Computational thinking, Abstraction, Decomposition, Algorithmic thinking
		2.1.2 - Designing, creating and refining algorithms	Algorithm, Flowchart, Process, Pseudocode, Exam Reference Language

		2.1.2 - Correcting and completing algorithms	Dry run, Trace Table
		2.1.3 – Searching and sorting algorithms Binary and linear searches	Linear search, Binary search
		2.1.3 – Searching and sorting algorithms Bubble, merge and insertion sorts	Bubble sort, Merge sort, List, Insertion sort, Ordered list, Unordered list
Summer Week 8 - 13	Practical Programming	Python Programming and Pseudocode	Variables, Operators (Boolean), Operators (Mathematical), Operators (Assignment), Input/output, Data Types, Sequence - (Strings, Lists, Tuples, Arrays, Range), Selection (IF or CASE SELECT), Iteration (Count- or condition-controlled), String Manipulation, Random Numbers, Arrays (1D or 2D), File Handling, Sub programs
Assessment point 3			