

Subject	GCSE OCR Computer Science
Paper	Paper 1 J277/01: Computer systems Paper 2 J277/02: Computational thinking, algorithms and programming
Work/skills/activities being covered in lesson leading to exams	Week 1 – Systems Architecture • Components of the CPU: ◦ ALU (Arithmetic Logic Unit) – Performs arithmetic and logical operations ◦ CU (Control Unit) – Directs operations within the CPU ◦ Cache – Stores frequently accessed data for quick retrieval ◦ Registers – Small storage locations within the CPU for immediate data access Week 2 – Memory and Storage • The need for secondary storage • Common types of storage: ◦ Optical (e.g., CDs, DVDs) ◦ Magnetic (e.g., Hard Drives) ◦ Solid State (e.g., SSDs) • Advantages and disadvantages of different storage media based on: ◦ Capacity ◦ Speed ◦ Portability ◦ Durability ◦ Reliability ◦ Cost Week 3 – Data Storage • Binary and Hexadecimal Conversions: ◦ Converting positive denary whole numbers to binary (up to 8 bits) and vice versa ◦ Adding binary numbers (up to 8 bits) and understanding overflow errors

- Converting denary numbers to hexadecimal (2-digit) and vice versa

- Sound Storage:
 - How sound is sampled and stored digitally
 - The effect of sample rate, duration, and bit depth on:
 - Playback quality
 - File size

Week 4 – Computer Networks, Connections, and Protocols

- Hardware needed for LAN (Local Area Network):
 - Wireless access points
 - Routers
 - Switches
 - NIC (Network Interface Controller/Card)
 - Transmission media
- The Internet as a global network:
 - DNS (Domain Name System)
 - Hosting
 - The Cloud
 - Web servers and clients

Week 5 – Network Security

- Forms of attack:
 - Malware
 - Social engineering (e.g., phishing)
 - Brute-force attacks
 - Denial of service (DoS) attacks
 - Data interception and theft
 - SQL injection
- Common prevention methods:
 - Penetration testing
 - Anti-malware software
 - Firewalls
 - User access levels
 - Passwords
 - Encryption
 - Physical security

Week 6 – Algorithms

- Creating, interpreting, correcting, completing, and refining algorithms using:
 - Pseudocode
 - Flowcharts
 - Reference language/high-level programming language
 - Trace tables

Week 7 – Searching and Sorting Algorithms

- Standard searching algorithms:
 - Binary search
 - Linear search
- Standard sorting algorithms:
 - Bubble sort
 - Merge sort
 - Insertion sort

Week 8 – Producing Robust Programs

- Defensive design considerations:
 - Anticipating misuse
 - Authentication
- Input validation
- Maintainability:
 - Use of subprograms
 - Naming conventions
 - Indentation
 - Commenting

Week 9 – Boolean Logic

- Simple logic diagrams using AND, OR, and NOT
- Truth tables
- Combining Boolean operators to solve problems

Week 10 – Programming Languages and IDEs

- Characteristics and purpose of different programming language levels:
 - High-level languages
 - Low-level languages
- The purpose of translators

	• Characteristics of: ◦ Compilers ◦ Interpreters
Areas to revise as a priority leading to exams	<u>Paper 1: Computer Systems</u> Systems Architecture – CPU, registers, Von Neumann architecture, fetch-execute cycle. Memory & Storage – RAM, ROM, virtual memory, secondary storage types, storage capacities, and units. Computer Networks – LANs/WANs, topologies, protocols (TCP/IP, HTTP, FTP, etc.), and network security. Network Security – Common threats (malware, phishing, social engineering, etc.) and prevention methods (firewalls, penetration testing, etc.). System Software – Operating systems, utilities (encryption, defragmentation, etc.). Ethical, Legal, Cultural, and Environmental Impacts – Data protection laws, privacy, and sustainability in computing. <u>Paper 2: Computational Thinking, Algorithms & Programming</u> Algorithms – Flowcharts, pseudocode, searching (linear/binary), sorting (bubble, merge, insertion). Programming Concepts – Variables, data types, selection, iteration, functions, and file handling. Data Representation – Binary, hexadecimal, character sets, images, sound, compression. Boolean Logic – Logic gates (AND, OR, NOT), truth tables, and logic circuits.
Suggested methods of revision	• Past Papers – within folders, green panned • Mock questions – within folders, green panned • Craig n Dave - https://www.youtube.com/@craigndave • Flashcards for key terminology • Revision books and same questions / answers. • Complete revision clocks to check knowledge and fill in any gaps of unknown content. Prioritise spending time revising the unknown content • Going over past mocks and notes work • Use of resources on Teams, e.g. lesson slides and video support links • Past essays with marked feedback – re-write areas of development and make suggested improvements. Hand them in to be further marked. • Seneca