



GCSE Revision Topics 2017 - 2019 Computer Science

Topic	Tick/date when revised				
1.1 System architecture					
• the purpose of the CPU					
• Von Neumann architecture:					
○ MAR (Memory Address Register)					
○ MDR (Memory Data Register)					
○ Program Counter					
○ Accumulator					
• common CPU components and their function:					
○ ALU (Arithmetic Logic Unit)					
○ CU (Control Unit)					
○ Cache					
• the function of the CPU as fetch and execute instructions stored in memory					
• how common characteristics of CPUs affect their performance:					
○ clock speed					
○ cache size					
○ number of cores					
• embedded systems:					
○ purpose of embedded systems					
○ examples of embedded systems.					
1.2 Memory					
• the difference between RAM and ROM					
• the purpose of ROM in a computer system					
• the purpose of RAM in a computer system					
• the need for virtual memory					
• flash memory.					
1.3 Storage					
• the need for secondary storage					
• data capacity and calculation of data capacity requirements					
• common types of storage:					
○ optical					
○ magnetic					
○ solid state					
• suitable storage devices and storage media for a given application, and the advantages and disadvantages of these, using characteristics:					
○ capacity					
○ speed					
○ portability					
○ durability					
○ reliability					



cost.

1.4 Wired and wireless networks

• types of networks:

LAN (Local Area Network)

WAN (Wide Area Network)

• factors that affect the performance of networks

• the different roles of computers in a client-server and a peer-to-peer network

• the hardware needed to connect stand-alone computers into a Local Area Network:

wireless access points

routers/switches

NIC (Network Interface Controller/Card)

transmission media

• the internet as a worldwide collection of computer networks:

DNS (Domain Name Server)

hosting

the cloud

• the concept of virtual networks.

1.5 Network topologies, protocols and layers

• star and mesh network topologies

• Wifi:

frequency and channels

encryption

• ethernet

• the uses of IP addressing, MAC addressing, and protocols including:

TCP/IP (Transmission Control Protocol/Internet Protocol)

HTTP (Hyper Text Transfer Protocol)

HTTPS (Hyper Text Transfer Protocol Secure)

FTP (File Transfer Protocol)

POP (Post Office Protocol)

IMAP (Internet Message Access Protocol)

SMTP (Simple Mail Transfer Protocol)

• the concept of layers

• packet switching.

1.6 System security

• forms of attack

• threats posed to networks:

malware

phishing

people as the 'weak point' in secure systems (social engineering)

brute force attacks

denial of service attacks

data interception and theft

the concept of SQL injection

poor network policy

• identifying and preventing vulnerabilities:

<input type="radio"/> penetration testing					
<input type="radio"/> network forensics					
<input type="radio"/> network policies					
<input type="radio"/> anti-malware software					
<input type="radio"/> firewalls					
<input type="radio"/> user access levels					
<input type="radio"/> passwords					
<input type="radio"/> encryption.					
1.7 Systems software					
• the purpose and functionality of systems software					
• operating systems:					
<input type="radio"/> user interface					
<input type="radio"/> memory management/multitasking					
<input type="radio"/> peripheral management and drivers					
<input type="radio"/> user management					
<input type="radio"/> file management					
• utility system software:					
<input type="radio"/> encryption software					
<input type="radio"/> defragmentation					
<input type="radio"/> data compression					
<input type="radio"/> the role and methods of backup:					
n full					
n incremental.					
1.8 Ethical, legal, cultural and environmental concerns					
• how to investigate and discuss Computer Science technologies while considering:					
<input type="radio"/> ethical issues					
<input type="radio"/> legal issues					
<input type="radio"/> cultural issues					
<input type="radio"/> environmental issues.					
<input type="radio"/> privacy issues.					
• how key stakeholders are affected by technologies					
• environmental impact of Computer Science					
• cultural implications of Computer Science					
• open source vs proprietary software					
• legislation relevant to Computer Science:					
<input type="radio"/> The Data Protection Act 1998					
<input type="radio"/> Computer Misuse Act 1990					
<input type="radio"/> Copyright Designs and Patents Act 1988					
<input type="radio"/> Creative Commons Licensing					
<input type="radio"/> Freedom of Information Act 2000.					