Essential content

The essential content is set out under content areas. Learners must cover all specified content before the assessment.

A Digital devices in IT systems

The concepts and implications of the use of, and relationships among, the devices that form IT systems.

A1 Digital devices, their functions and use

The features and uses of digital devices in IT systems to meet the needs of individuals and organisations.

- Digital devices that form part or all of IT systems:
  - multifunctional devices
  - personal computers
  - mobile devices
  - servers
  - entertainment systems
  - digital cameras – still, video
  - navigation systems
  - data capture and collection systems
  - communication devices and systems.
- The function and use of digital devices for:
  - education and training
  - personal
  - social
  - retail
  - organisational use – business operations, internal and external dissemination of information
  - creative tasks.

A2 Peripheral devices and media

The features and uses of peripheral devices and media in IT systems to meet the needs of individuals and organisations.

- Peripheral devices used with other digital devices to form part of an IT system:
  - input devices
  - output devices
  - storage devices.
- Manual and automatic data processing.
- Accessibility devices.
- Characteristics and implications of storage media used to form part of an IT system.

A3 Computer software in an IT system

The concepts and implications of the use of, and relationships between, hardware and software that form large- and small-scale IT systems and their impact on individuals and organisations.

- Types of operating system:
  - real-time operating system
  - single-user single task
  - single-user multi-tasking
  - multi-user.

- The role of the operating system in managing:
  - networking
  - security
  - memory management
  - multi-tasking
  - device drivers.
- Factors affecting the choice and use of user interfaces:
  - graphical
  - command line
  - menu based
  - adapted.
- Factors affecting the choice of operating system.
- Factors affecting use and performance of an operating system.
- Utility software:
  - the purpose, features and uses of utility software
  - factors affecting the choice, use and performance of utility software.
- Application software:
  - the purpose, features and uses of application software
  - factors affecting the choice, use and performance of application software.
- The principles and implications of open source and proprietary operating systems and software.
- The impact and features of user interfaces in computer software.
- The features of common file types and formats used for:
  - images
  - videos
  - application software.
- The implications on IT systems, individuals and organisations of the use and selection of file types and formats.

A4 Emerging technologies

How emerging technologies can be used by individuals and organisations.

- The concepts and implications of how emerging technologies affect the performance of IT systems.
- Implications of emerging technologies on the personal use of IT systems.
- Implications of emerging technologies on the use of IT systems in organisations.

A5 Choosing IT systems

How the features of an IT system can affect its performance and/or the performance of a larger IT system.

- Factors affecting the choice of digital technology:
  - user experience – ease of use, performance, availability, accessibility
  - user needs
  - specifications
  - compatibility
  - connectivity
  - cost
  - efficiency
  - implementation – timescales, testing, migration to new system(s)
  - productivity
  - security.

B Transmitting data

The concepts, process and implications of transferring data within and between IT systems.

B1 Connectivity

- Wireless and wired methods of connecting devices and transmitting data within and between IT systems.
- How the features of connection types can meet the needs of individuals and organisations.
- The implications of selecting and using different connection types.
- The impact of connection types on the performance of an IT system.

B2 Networks

The concepts and implications for individuals and organisations of connecting devices to form a network.

- The features, use and purpose of different networks:
  - personal area network (PAN)
  - local area network (LAN)
  - wide area network (WAN)
  - virtual private network (VPN).
- Factors affecting the choice of network:
  - user experience – ease of use, performance, availability, accessibility
  - user needs
  - specifications
  - connectivity
  - cost
  - efficiency
  - compatibility
  - implementation: timescales, testing, downtime
  - productivity
  - security.
- How the features of a network and its component parts affect the performance of an IT system.

B3 Issues relating to transmission of data

How the features and processes of data transmission affect the use and performance of IT systems.

- Protocols used to govern and control data transmission for common tasks:
  - email
  - voice and video calls over the internet
  - web pages
  - secure payment systems.
- Security issues and considerations when transmitting data over different connection types and networks.
- Factors affecting bandwidth and latency.
- The implications of bandwidth and latency on the use and performance of an IT system.
- Types of compression:
  - lossy
  - lossless.
- The applications and implications of data compression.
- The use and implications of codecs when using and transmitting audio and video in digital format.

C Operating online

The implications for individuals and organisations of using online IT systems.

C1 Online systems

The features, impact and implications of the use of online IT systems to store data and perform tasks.

- The personal and professional uses and applications of cloud storage.
- The personal and professional uses and applications of cloud computing.
- The impact and implications on individuals of using cloud storage and computing.
- The impact and implications on organisations of using cloud storage and computing.
- Systems that enable and support remote working:
  - VPNs
  - remote desktop technologies.
- Factors affecting the use and selection of online systems:
  - security
  - cost
  - ease of use
  - features
  - connectivity.

C2 Online communities

The features of online communities and the implications of their widespread use for organisations and individuals.

- Ways of communicating and interacting with online communities:
  - social media
  - blog, microblog, vlog
  - wiki
  - chatrooms
  - instant messaging
  - podcasts
  - forums.
- The implications for individuals of using and accessing online communities:
  - user experience – ease of use, performance, availability, accessibility
  - meeting needs
  - cost
  - privacy
  - security.
- The implications for organisations of using and accessing online communities:
  - employee and customer experience – ease of use, performance, availability, accessibility
  - customer needs
  - cost
  - implementation – timescales, testing
  - replacement or integration with current systems
  - productivity
  - working practices
  - security.

D Protecting data and information

The issues and implications of storing and transmitting information in digital form.

D1 Threats to data, information and systems

The implications of accidental and malicious threats to the security and integrity of data, held in, and used by, IT systems.

- The characteristics of threats to data:
  - viruses and other malware
  - hackers
  - phishing
  - accidental damage.
- The impact of threats to data, information and systems on individuals.
- The impact of threats to data, information and systems on organisations.

D2 Protecting data

The features, uses and implications of systems and procedures used to protect the data of individuals and organisations.

- Processes and implications of techniques for protecting data and systems:
  - file permissions
  - access levels
  - backup and recovery procedures
  - passwords
  - physical access control
  - digital certificates
  - protocols.
- The features, characteristics and implications of using antivirus software to protect data.
- The features, characteristics and implications of using firewalls to protect data.
- The features, applications and implications of encryption methods used to protect:
  - stored data
  - data during transmission.
- The role of current legislation in protecting data and IT systems from attack and misuse.
- The impact on individuals and organisations of legislation designed to protect data and IT systems.
- The purpose, role and impact, on individuals and organisations, of codes of practice for the protection of data produced by the Information Commissioner's Office (UK) and professional bodies.

E Impact of IT systems

The uses, issues and implications of IT systems and their impact on individuals and organisations.

E1 Online services

How the features of online services are used to meet the needs of individuals and organisations.

- The features and implications of using online services to support:
  - retail
  - financial services
  - education and training
  - news and information
  - entertainment and leisure
  - productivity
  - booking systems.

- The uses, impact and implications for individuals and organisations of:
  - transactional data
  - targeted marketing
  - collaborative working.

E2 Impact on organisations

- The features and implications of IT systems used by organisations for:
  - stock control
  - data logging
  - data analysis
  - general office tasks
  - creative tasks
  - advertising
  - manufacturing
  - security.
- The impact and implications for organisations of IT systems in terms of:
  - user experience – ease of use, performance, availability, accessibility
  - employee and customer needs
  - cost
  - implementation – timescales, testing, downtime
  - replacement or integration with current systems
  - productivity
  - working practices
  - staff training needs (initial and ongoing)
  - user support
  - security.

E3 Using and manipulating data

The uses, processes and implications for individuals and organisations of accessing and using data and information in digital form.

- Sources of data:
  - primary
  - secondary.
- Judging and ensuring the reliability of data.
- The characteristics and implications of methods of collecting data and opinions:
  - survey
  - questionnaire
  - focus groups
  - interview.
- Reasons for ensuring data accuracy.
- Methods of ensuring data accuracy:
  - verification
  - validation.
- Methods of extracting and sorting data.
- Numerical and data modelling.
- Presenting data and results.

- The characteristics and implications of user interfaces for data collection and processing systems:
  - ease of use
  - accessibility
  - error reduction
  - intuitiveness
  - functionality
  - performance
  - compatibility.

F Issues

The concepts, impacts and implications of issues resulting from the use of IT systems.

F1 Moral and ethical issues

The implications, for individuals, organisations and wider society, of moral and ethical factors of using information technology.

- The moral and ethical factors of the use of information technology:
  - privacy
  - environmental
  - unequal access to information technology
  - online behaviour and netiquette
  - globalisation
  - freedom of speech and censorship
  - acceptable use.
- The purpose and role of codes of practice produced by professional bodies for the use of IT systems.
- The impact of codes of practice on individuals and organisations.

F2 Legal issues

The legal issues relating to the use of IT systems and the implications for individuals, organisations and wider society.

- The role of current legislation (and subsequent additions and amendments) in protecting users and their data from attack and misuse:
  - Computer Misuse Act 1990
  - Police and Justice Act 2006 (Computer Misuse)
  - Copyright, Designs and Patents Act 1988
  - The Copyright (Computer Programs) Regulations 1992
  - The Health and Safety (Display Screen Equipment) Regulations 1992
  - Data Protection Act 1998
  - Consumer Rights Act 2015.
- Guidelines and current legislation (and subsequent additions and amendments) designed to ensure the accessibility of IT systems:
  - Disability Discrimination Acts 1995 and 2005
  - Equality Act 2010
  - British Standards Institute (BSI) codes of practice
  - Open Accessibility Framework (OAF)
  - Web Content Accessibility Guidelines (WCAG) 1.0 and 2.0 World Wide Web Consortium (W3C®).
- The moral and ethical factors of the use of IT systems:
  - health and safety
  - copyright
  - computer misuse
  - protection of data
  - privacy
  - accessibility.