







2021-22 CURRICULUM MAP FOR ICT YEAR 12

<p>HALF TERM 1:</p> <p><u>All Pathways</u></p> <p>KQ1 – What are the components that make up a computer system?</p> <p><u>(a) Input devices</u> -Conventional input devices – mouse, keyboard, microphone, touch screen -Devices for additional needs – foot mouse, braille keyboard, eye typer, membrane keyboard, waterproof input devices</p> <p><u>(b) Output devices</u> -Conventional output devices – speaker, integrated screen, monitor, projector, printer. -Devices for additional needs – screen magnifiers, screen readers</p> <p><u>(c) Communications devices</u> -Commonly used communication devices – Wireless card, Bluetooth card, mobile network card.</p> <p><u>(d) Uses</u> -Of devices, in a range of situations -Of devices for individuals with additional needs</p> <p><u>(e) Benefits and limitations</u> -Of input and output devices, in a range of situations, including different environments -Of integrated devices and external devices -Of similar devices over each other -Of different devices for individuals with additional needs</p> <p>KQ2 – What role does each computer component play in the function of a computer system?</p> <p><u>(a) Motherboard</u> -Purpose/function</p> <p><u>(b) Processors</u> -Purpose -Characteristics - clock speed, number of cores, cache size</p> <p><u>(c) Storage</u> -Purpose -Characteristics -Uses -Types - magnetic, hard drive, solid state, flash, internal, removable, SAS, SCSI, portable, Cloud.</p> <p><u>(d) Ports</u> -Purpose -Uses -Differences -USB – most widely used, USB 2.0, USB, 3.0 -Firewire – alternative to USB, increased data transfer. -SATA – used to transfer data between internal storage devices and a computer system. Network – Ethernet. Used to send data across a cabled network. -Fibre Channel – High speed transfer of data to/from storage in a commercial setting e.g. data centre</p> <p><u>(e) Memory</u> -Purpose/function -Characteristics</p>	   	<p>EDP pathway – Independent use of websites explaining the purpose and uses of augmented and virtual reality AD pathway – Independent use of websites explaining the characteristics of the development methodologies</p> <p>EDP pathway – Written explanation of the purpose and uses of augmented and virtual reality AD pathway – Written explanation of the characteristics of the development methodologies</p> <p>Discussion of the advantages and disadvantages of the Internet of things</p> <p>Links to maths – binary/hexadecimal number systems and use capacity units</p>
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-RAM – read/write, stores data that is currently being used, volatile.

-ROM – read only, stores instructions to boot the computer, non-volatile

-Cache – read/write, stores instructions that are used frequently, volatile

(f) Other

-Expansion cards - i.e. sound, network, graphics, storage controller, fibre channel

-Power supplies

KS3 – How are different computers systems utilised?

(a) Types/Characteristics

Types - Desktop/server, tablet/hybrid, laptop, smartphone, mainframe, quantum

Characteristics – Processing power, cost, cost to maintain, physical size/portability

(b) Uses

-Of each type of computer system

-How each type of computer system is suited to its use, physically and computationally

(c) Benefits/Limitations

-Of each type of device, in relation to their uses and characteristics

KQ4 – How are computer systems changing the devices that we use every day?

(a) Embedded Systems

-Purpose/functions

-Examples:

-Are embedded systems – MP3 players, mobile phones, video game consoles, digital cameras, DVD players etc.

-Include embedded systems – Microwave ovens, washing machines, cars.

(b) Internet of things

-Definition/purpose/function

-Benefits/drawbacks of internet connected devices

-Examples - security systems, thermostats, cars, electronic appliances, lights, alarm clocks, speaker systems, vending machines.

KQ5 – How are devices connected to enable them to communicate?

(a) Wired

-Types – Copper, Fibre

-Purpose/uses

-Characteristics of each type – distance, cost, speed

(b) Wireless technologies

-Types - Bluetooth, WiFi, microwave, infrared, laser, Satellite, GSM, 3G/4G and future technologies

-Purpose/uses

-Characteristics of each type – distance, cost, speed, stability

KQ6 - Which hardware is needed to enable devices to communicate?

(a) Devices

-Devices - Hub, switch, router, modem, wireless access point

-Purpose/uses

-Characteristics

(b) Combined/hybrid devices

-Devices - Home router

-Benefits/drawbacks of combined devices



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KQ7 – How are network faults troubleshooted?

(a) Identifying hardware faults

- Diagnostic tools
- Isolating network components to ascertain fault location.

(b) Troubleshooting tools

- Purpose
- Installable tools which can enable an administrator to troubleshoot network faults/issues.
- Tools – to give statistics of network traffic, identify where packets are being lost, test speeds etc.

(c) Documentation/fault management

- Purpose
- Network manual – A document which details key information needed to troubleshoot issues on a network.

KQ8 – How is the size of files/capacity of devices measured?

(a) Units

Bit (single binary digit, 1 or 0), Nibble (4 bits), Byte (8 bits),

(b) Metric

Kilobyte (1,000 bytes or 1 KB), Megabyte (1,000 KB), Gigabyte (1,000 MB), Terabyte (1,000 GB), Petabyte (1,000 TB)

(c) Binary

Kibibyte (1,024 bytes or 1 KiB), Mebibyte (1,024 KiB), Gibibyte (1,024 MiB), Tebibyte (1,024 GiB), Pebibyte (1,024 TiB)

KQ9 – How are numbers represented using the binary number system?

(a) Binary Number System

- The symbols used – 1 and 0.
- Each column increases in powers of 2 e.g. 2^2 2^1 2^0

(b) Conversion

- Convert positive denary numbers to binary numbers (up to and including 8 bits)
- Convert positive binary numbers to denary numbers (up to and including 8 bits)

KQ10 – How are numbers represented using the hexadecimal number system?

(a) Hexadecimal Number System

- The symbols used – 0-9, A-F
- Each column increases in powers of 16 e.g. 16^1 16^0

(b) Conversion

- Convert positive denary whole numbers into 2-digit hexadecimal numbers
- Convert positive 2-digit hexadecimal numbers into denary whole numbers
- Convert binary integers to their hexadecimal equivalents
- Convert hexadecimal values to their binary equivalents

Emerging Digital Practitioner Pathway

HT1 - What are virtual and augmented reality, and how are they used?

KQ1 - Who are the pioneers in the field of virtual and augmented reality?

(a) Virtual reality as a concept

- What is virtual reality



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-What is augmented reality
-What are the differences between augmented and virtual reality
(b) Pioneers
-Douglas Engelbart
-Ivan Sutherland
-Tom Caudell and David Mizell
-Developments in the virtual and augmented reality field, by each pioneer.
KQ2 – How are virtual and augmented reality used?
(a) Areas
-Architecture
-Business - marketing, service and planned maintenance.
-Education - textbooks, skills development, remote collaboration.
-Entertainment, leisure and the media - tourism, games, museums.
-Health care and surgery - training, simulations.
-Military - training, simulations.
-Sport - live streaming of scores and other statistics, sponsorship images.
-Navigation
(b) Specific Uses
-US Military Nuclear Defence systems
-Pilot training
-Mattel “data glove”
-Personal guidance system for visually impaired
-Chameleon
(c) Examples/Features
-Of the uses of both augmented and virtual reality, in all areas
KQ3 - What are the possible impacts of virtual and augmented reality?
(a) Impacts
-Visualisation of designs
-Simulations
-Training
-Demonstrations of concepts
-Virtual tours
(b) Benefits
-Of each impact to organisations and users.





Application Developer Pathway

HT1 - How applications are designed?

KQ1 - How are software applications designed?
(a) Application Development
-Divide the process of development into distinct phases.
-Stages vary depending on the model but all include, in some form stages
(b) Phases of development
-Phases - Requirements analysis, design, implementation/coding, testing, deployment, maintenance
-The purpose of each phase of development
KQ2 – How can the development of software applications be structured?
(a) Application development models



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<p>-Waterfall model, iterative model, agile development model, rapid application development (RAD) model, spiral model, prototype model <u>(b) Characteristics/Features</u> Of each application development model.</p>		
<p>HALF TERM 2: <u>All Pathways</u></p>		<p>Reading of a troubleshooting guide for a software product</p>
<p>KQ1 – What are the different ways that software can be released? <u>(a) Types</u> Open source, closed source, off the shelf, bespoke, shareware, freeware, embedded <u>(b) Characteristics</u></p>		<p>EDP pathway – Written design plan for an augmented or virtual reality product AD pathway – Written feasibility study/functional requirements for an application design</p>
<p>-Of each software type <u>(c) Uses</u> -Appropriate situations where each type of software may be used</p>		<p>Discussion of the advantages and disadvantages of each communication method that is available to computer users</p>
<p>KQ2 – Which software applications are available to computer users? <u>(a) Types</u> -Productivity software - Word processor, spreadsheet, database, email) -Development tools - compiler, debugger, translator, integrated design environment -Business software - MIS, multimedia, collaboration, project management, manufacturing, CAD/CAM, publishing, expert systems, healthcare. <u>(b) Purpose/Uses</u> -Of each type of application software <u>(c) Advantages/Disadvantages</u> -Of use of each type of application software KQ3 – How can software be used to maintain a computer system? <u>(a) Utility software</u> -Designed to help to analyse, configure, optimise or maintain a computer. Perform specific tasks. <u>(b) Types</u> -Backup, anti-virus, compression. <u>(c) Purpose/Uses</u> -Of each type of utility software KQ4 – What is the role of the operating system in a computer system? <u>(a) Types</u> -Single user - Allows a single user to perform a task, or more than one task, at a time -Multiuser - Allows multiple users to perform a task, or more than one task, at a time -Single processor - Contains only one processor. So only one process can be executed at a time. Multiple programs can be run -Multiprocessor – Contains more than once processor/CPU. Multiple processes can be executed simultaneously, which aids multitasking. <u>(b) Purpose/Uses/Functions</u> -Of each type of operating system <u>(c) Benefits/limitations</u></p>		<p>Links to business studies – use IT software and communication methods, sin business</p>



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-Of each type of operating system

(d) Source

-Off the shelf – Pre written, created to run on a variety of hardware components/machines.

-Open source – Pre written, created to run on a variety of hardware components/machines, released with the source code to make modifications, add features etc.

Bespoke – Custom written to suit the requirements of the user and usually specifically written for a certain set of hardware.

KQ5 - What are the different communication methods that are available to computer users?

(a) Types

-Characteristics/Purpose

-SMS – Short Message Service, email, messaging software e.g. Whatsapp, social networking/social media, VoIP, personal assistants (e.g. Siri, Google Home), teleconference, video conference, cellular/satellite, instant messaging

(b) Advantages and disadvantages

Of each type, in relation to their uses/purpose.

KQ6 – How can we troubleshoot issues which arise?

(a) Common faults

-Causes

-Unexpected software behaviour – usually signalled by an error message.

-Software freeze – software stops functioning and cannot perform any functions. Usually there are no error messages

-Unexpected rebooting – usually a hardware related issue, which causes the computer to restart to fix it.

(b) Troubleshooting tools

-Purpose of each type of troubleshooting tool

-Logs – record the error number of any errors that occur

-Installable tools – Installable tools which can detect and possibly automatically resolve issues.

-Baselines - a snapshot of you're the software/system normally acts/normally runs, in terms of system usage etc.

(c) Documentation

-Purpose

-Troubleshooting guides - technical document to give a user information on how to solve and prevent problems

KQ7 - How is the communication of different devices managed?

(a) The need for protocols

-Agreed structure of communication between different devices.

(b) Common Protocols

IP (Internet Protocol)

-TCP (Transmission Control Protocol), UDP (User Data Protocol), SMTP (Simple Mail Transfer Protocol), FTP (File Transfer Protocol), HTTP (Hyper Text Transfer Protocol), SNMP (Simple Network Management Protocol), ICMP (Internet Control Message Protocol), POP (Post Office Protocol)

(c) Purpose

-Purpose/features of each protocol.

-Common uses of each protocol.

Emerging Digital Practitioner Pathway



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HT2 - How are virtual and augmented reality resources designed?

KQ1 - How are hardware technologies used within virtual and augmented reality?

(a) Hardware

- Processor
- Display - handheld device, head mounted display, eyeglasses, head up display
- Sound - speakers, headphones
- Sensors - optical, accelerometer, GPS, compass, RFID
- Input devices - camera, microphone

(b) Examples/Uses

-Of each hardware technology, within both virtual and augmented reality.

KQ2 - How are software technologies used within virtual and augmented reality?

(a) Software

- Range of products available
- Features of the software
- Image registration
- Augmented Reality Mark-up Language

(b) Examples/Uses

-Of each software technology, within both virtual and augmented reality.

KQ3 - How are virtual and augmented reality resources designed?

(a) Designs

- Aims of the product - intended outcome, success criteria, information to be delivered, where the product is to be used.
 - Financial plan
 - Quality plan
 - Target audience - age, gender, income.
 - Nature of the product - single user product, multiuser product.
 - Content including resource plan
 - Design tools - storyboarding, mind mapping, mood boards.
 - Trigger image(s) and the stage(s) that follow on from the trigger being accessed
 - Hardware and software requirements
- (b) Purpose
- Of each design component.
- (c) Practical experience
- Of creating design components.

Application Developer Pathway

HT2 - How are potential solutions for application developments investigate?



KQ1 - How can the requirements of a user be gathered?

(a) Methods

- Client and user interviews - closed and open questions, leading questions, funnelling, structure to interviews,




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<p>allowing thinking time for respondents, encouraging further detail or thought</p> <ul style="list-style-type: none"> -Observation of tasks -Analysis of existing documents and systems <p><u>(b) Purpose/advantages and disadvantages</u></p> <ul style="list-style-type: none"> -Of each method of gathering user requirements. <p>KQ2 - What are the different requirements that a customer can have?</p> <p><u>(a) Functional requirements</u></p> <ul style="list-style-type: none"> -What the application should do -Data and information collected and used in the existing approach -Data and information to be collected and used in the new application -Functions or processing that the application should perform -Outputs from the application -Core functional requirements -Optional functional requirements -User interface requirements including accessibility requirements -Core requirements vs optional requirements. <p><u>(b) Constraints</u></p> <ul style="list-style-type: none"> -Hardware or platform constraints -Software constraints -Development constraints e.g. development software <p><u>(c) Limitations</u></p> <ul style="list-style-type: none"> -e.g. scope of solution, aspects that will not be developed. <p><u>(d) Examples</u></p> <ul style="list-style-type: none"> -Of each type of requirement, constrain and limitation, in a variety of scenarios. <p>KQ3 – What approaches should be taken to a solution?</p> <p><u>(a) Possible solutions</u></p> <ul style="list-style-type: none"> -Different ways to address the identified user needs <p>KQ4 – How can you ensure that a software applications design project is feasible?</p> <p><u>(a) Feasibility study</u></p> <ul style="list-style-type: none"> -Technological requirements -Economic or financial costs of development, and potential benefits -Legal issues -Operational impact -Scheduling and resources - time scale for development, resources needed for development. <p><u>(b) Purpose/Uses</u></p> <ul style="list-style-type: none"> -Of each area of a feasibility study 		
<p>HALF TERM 3: Topic/Unit</p> <p><u>All Pathways</u></p> <p>KQ1 – What is the role of a server within a computer network?</p> <p><u>(a) Purpose/Need</u></p> <ul style="list-style-type: none"> -A centralised resource which other computers connect to/manages resources on a network. 		<p>Independent use of websites to explaining the characteristics, advantages and disadvantages of each network topology</p>
		<p>EDP pathway – Written evaluation of augmented/virtual reality product AD pathway – Written analysis of proposed software application</p>



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<p><u>(b) Type</u></p> <ul style="list-style-type: none"> -The role/purpose of each server type. -Type - File/print, application, database, web, mail, hypervisor 		<p>Peer teaching of the characteristics, advantages and disadvantages, of a given network topology.</p>
<p>KQ2 - How can virtualisation be used improve the efficiency and reduce the cost of a network?</p> <p><u>(a) Purpose</u></p> <ul style="list-style-type: none"> -creating a software-based, or virtual, representation of something, such as virtual servers, storage and networks. -e.g. one physical machine hosting two servers, which appear to the users as separate machines. <p><u>(b) Type</u></p> <ul style="list-style-type: none"> -The role/purpose of each type of virtualisation. -server, client, storage, cloud, hybrid <p><u>(c) Benefits and limitations</u></p> <ul style="list-style-type: none"> -Benefits - Cheaper running costs, faster to setup/install virtual servers, increased energy efficiency. -Limitations – increased technical difficulty, increased setup costs, limited scalability. <p>KQ3 - What are the different roles of computers in a client-server and a peer-to peer network?</p> <p><u>(a) Types</u></p> <p>Peer to peer –</p> <ul style="list-style-type: none"> -No single device is responsible for being the server. -Peers store their own files, act as a server and have responsibility for providing data. <p>Client server –</p> <ul style="list-style-type: none"> -The network has a central server, which clients are dependent on, and connect to for certain services (KQ1). <p>KQ4 - How are computer networks physically structured?</p> <p><u>(a) Types/Topologies</u></p> <ul style="list-style-type: none"> -Characteristics -Types - Bus, star, ring, mesh <p><u>(b) Advantages/Disadvantages</u></p> <ul style="list-style-type: none"> -Of each network topology <p><u>(c) Diagrammatical Representation</u></p> <ul style="list-style-type: none"> -Of each network topology <p>KQ5 – How are computers on a network addressed?</p> <p><u>(a) Default gateway</u></p> <ul style="list-style-type: none"> -A device which is the access point to another network. -Connects a local network to the internet, usually a router. -Understands specific routes that must be taken to move internet requests from a computer out of the network. <p><u>(b) IP address</u></p> <ul style="list-style-type: none"> -When connected to a network each device is given a unique IP address. It is used to communicate with devices. -Four sets of up to three digits, each with a maximum value of 255 e.g. 192.168.0.1 <p><u>(c) Subnet mask</u></p> <ul style="list-style-type: none"> -Subnetting – dividing a network into smaller segments, logically. -A subnet mask hides part of an IP address and defines the number of IP addresses in the sub network. <p>KQ6 - How are different networks connected together?</p> <p><u>(a) Types</u></p> <ul style="list-style-type: none"> -LAN – single geographical location, use of Ethernet/Token Ring for connectivity. 		<p>Links to business studies – how do businesses use computer systems</p>



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<p>-WAN – connection between distinct geographical areas, use of ADSL/leased line/ISDN for connectivity.</p> <p>-MAN – interconnects users in a geographic area or region</p> <p>-Voice - PSTN, cellular.</p> <p>-Satellite - voice, data.</p> <p><u>(b) Characteristics/purpose</u> Of each network type.</p> <p>KQ7 – How do businesses utilise IT systems?</p> <p><u>(a) Types</u> MIS (Management Information System), CRM (Customer Relationship Management), SOP (Sales Ordering Process / Standard Operating Procedures), helpdesk.</p> <p><u>(b) Purpose</u> -Of each type of business system</p> <p><u>(c) Benefits and limitations</u> -Of each business system, in relation to its purpose.</p> <p><u>Emerging Digital Practitioner Pathway</u></p> <p>HT3 - How are virtual and augmented reality resources created?</p> <p>KQ1 - How are virtual and augmented reality resources developed?</p> <p><u>(a) Develop</u> -Create the trigger point of interest -Create the layer(s)/overlay(s)</p> <p><u>(b) Practical experience</u> -Of creating virtual and augmented reality components.</p> <p>KQ2 - How are virtual and augmented reality resources tested?</p> <p><u>(a) Test plans</u> -Features of a test plan</p> <p><u>(b) Testing</u> -Testing during development -End user testing -Review against original success criteria</p> <p><u>(c) Practical experience</u> -Of creating a test plan -Of testing virtual and augmented reality resources</p> <p>KQ3 - How are virtual and augmented reality resources evaluated?</p> <p><u>(a) Design stage</u> -Has suitable success criteria been identified?</p> <p><u>(b) Project management stage</u> -Has the developer deviated from the original scope? -Has the developer deviated from the budget as defined in the financial plan?</p> <p><u>(c) Creation stage</u> -Does the product deliver business benefits identified in the business case? -Has the product achieved the objectives in the terms of reference? -Has the product deviated from forecast resource levels as per the resource plan? -Does the product conform to the management process as per the execution phase?</p> <p><u>(d) Improvements</u></p>		
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- Identify potential improvements for similar future projects
- (e) Practical experience
- Of evaluating all stages of the development process

Application Developer Pathway

HT3 - How are designs for application solutions generated?

KQ1 – How can diagrams be used to represent aspects of the design of an application?

(a) Diagrams

- Functional requirements - use case diagrams.
- Processing and data handling - flowcharts, data flow diagrams, class diagrams, object diagrams, entity relationship diagrams.
- User interface designs - wireframe diagrams and graphical mock-ups.

(b) Examples

- Of each diagram type, for a variety of software applications.
- Drawing diagrams for a variety of interfaces, in a variety of scenarios.

KQ2 - Why is the standardisation of design important?

(a) Standardisation

- Ensure that certain aspects of a design conform to agreed standards.
- The need for and importance of, standardisation.

(b) Aspects of standardisation

- Standard algorithms or processes
- Modularisation
- Cross-platform standards
- Standard protocols
- Standard interface widgets e.g. appearance of buttons, dropdown menus, hyperlinks
- Common user interface layouts, icons and labels throughout application

(c) Examples

- Of the use of standardisation, within a variety of application examples.

KQ3 – What are the potential advantages of a proposed software application design?

(a) Advantages

- Automation
- Operational efficiency
- Cost-effectiveness
- Globalisation
- Improved communication
- Customisation and adaptability
- Increased markets
- Ease of access for customers
- New marketing opportunities
- Customer or user information
- Real-time information
- New employment





(b) Examples/Effects

- Of each advantage, to an organisation or end user.

KQ4 – What are the potential disadvantages of a proposed software application design?



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<p><u>(a) Disadvantages</u> -Financial cost -Changeover costs and risks -Training needs -Lack of job security and job losses -Security issues -Privacy issues -Potential customer concerns -Loss of personal contact</p> <p><u>(b) Examples/Effects</u> Of each disadvantage, to an organisation or end user.</p>		
<p>HALF TERM 4: Topic/Unit</p> <p>All Pathways</p> <p>KQ1 – Why are communication skills are valued by employers?</p> <p><u>(a) Communication Skills</u> -Interpersonal skills - eye contact, body language. -Questioning techniques -Verbal (i.e. meetings, telephone, group discussions) -Written (i.e. reports, letters, emails, social networking) -Non-verbal (i.e. body language)</p> <p><u>(b) Barriers to communication</u> -Barriers - language, distraction, noise, lack of concentration.</p> <p><u>(c) Appropriate use of language</u> -Formal, informal, technical, non-technical)</p> <p>KQ2 – How can technology be used to communicate?</p> <p><u>(a) Types</u> -Presentation software, word processing, email, web, blogs/vlogs, instant messaging</p> <p><u>(b) Purpose/use</u> -Of each communication type -Advantages/disadvantages of each type, in relation to its use.</p> <p>KQ3 – Which personal attributes are valued by employers?</p> <p><u>(a) Types</u> Personal attributes - Self-motivation, leadership, respect, dependability, punctuality, problem solving, determination, independence, time management, team working, written numerical and verbal skills, planning and organisation skills. -Why is each personal attribute valued?</p> <p>KQ4 – How can an employee ensure that they are ‘ready for work’?</p> <p><u>(a) Ready for work</u> -Dress (i.e. appropriate clothing depending on situation) -Presentation (i.e. personal grooming, appearance etc.) -Attitude (i.e. can-do attitude, responsive).</p> <p><u>(b) Importance</u> -Understanding of why each is important to an employer.</p> <p>KQ5 Which careers are available in the IT industry?</p> <p><u>(a) Careers</u> Network manager, IT technician, Programmer, Web designer, Animator</p> <p><u>(b) Key Skills</u> -The key skills required for each type.</p>	<p></p> <p></p> <p></p> <p></p>	<p>Job adverts/personal specifications for job advertisements</p> <p>Explanation of the personal attributes which are valued by employers</p> <p>Presentation of a chosen career within the IT industry</p> <p>Links to careers – employability skills, personal attributes and IT careers</p>



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<p>-The responsibilities of each type</p> <p>KQ6 - Why do professional bodies exist within an industry?</p> <p><u>(a) Professional bodies</u></p> <ul style="list-style-type: none">-Purpose-Bodies: BCS <p><u>(b) Benefits and limitations</u></p> <ul style="list-style-type: none">-Of membership of professional bodies to employees-Of membership of professional bodies to employers <p>KQ7 - Why does industry standard certification exist within an industry?</p> <p><u>(a) Purpose</u></p> <ul style="list-style-type: none">-The purpose of industry standard qualifications/certification-Current - CompTia ®, Cisco ® <p><u>(b) Benefits</u></p> <ul style="list-style-type: none">-Benefits of industry standard certification to an individual-Benefits of industry standard certification to an employer <p><u>Emerging Digital Practitioner Pathway</u></p> <p>HT4 - What are possible applications for virtual and augmented reality in the future?</p> <p>KQ1 - How can virtual and augmented reality be used in the future?</p> <p><u>(a) Possible developments</u></p> <ul style="list-style-type: none">-Of virtual and augmented reality-Advances in treating injuries or disease-Leisure activities-The environment-The home-Education <p><u>(b) Impacts</u></p> <ul style="list-style-type: none">-Of a range of possible future uses and how these may impact on society. <p>KQ2 - How can virtual and augmented reality be re-proposed?</p> <p><u>(a) Re-proposing of products</u></p> <ul style="list-style-type: none">-How existing products may be re-purposed and used in wholly new ways-e.g. medical uses in the field of animal welfare, training uses in the field of education, heads up display used to augmented learning in schools <p><u>(b) Benefits</u></p> <ul style="list-style-type: none">-Of repurposing/using current examples of resources in new ways <p><u>Application Developer Pathway</u></p> <p>HT4 - Be able to present application solutions to meet client and user requirements</p> <p>KQ1 – What information does an effective pitch include?</p> <p><u>(a) Information</u></p> <ul style="list-style-type: none">-What is the proposed design solution?-Who would be interested in it? And why?		
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-Why is it a valuable idea?

-What makes it effective?

(b) Examples

-Of each type of information, in a range of scenarios.

KQ2 - How can enhance your ability to deliver an effective pitch?

(a) Effective pitch delivery

-Courtesy

-Speak clearly and concisely

-Be aware of body language

-Accurate spelling, punctuation and grammar

-Engage the audience

-Be honest

-Be positive

(b) Practical experience

Of effective pitch delivery.

KQ3 – How can enhance your ability to respond to questions effectively?

(a) Effective responses

-Anticipating likely questions

-Giving a positive response

-Seeking clarification where necessary

-Recognising improvements and responding in a way that suggests how these can be incorporated

(b) Practical experience

-Of effective responses to questions.

KQ4 - How can prototyping contribute to the success of a software application

(a) Prototyping

-Purpose of prototyping

-Features of prototypes

-Interviewing and questioning techniques

-Development formats

(b) Examples

-Of a range of prototypes for different software applications.

(c) Practical experience

-Of creating a prototype.

KQ5 - How important is user feedback in the development of a software application?

(a) User Feedback

-Meeting core requirements and any optional requirements

-Effectiveness - how well the design meets each requirement

-Usability - how easy it is to carry out actions, readability and clarity of displays or output to user, navigability

-Learnability - how easy it is to learn how to use the application, clarity of the function of different components or elements.

(b) Methods

Interview, questionnaire.

(c) Practical experience

-Of acquiring user feedback.

KQ6 – How can user feedback be analysed to inform the application development process?

(a) Analysis of feedback

-Identify distinct points in feedback

-Identify required changes







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<p>-Identification and implementation of improvements based on feedback <u>(b) Practical experience</u> -Of analysing user feedback.</p>		
<p>HALF TERM 5:</p> <p>All Pathways</p> <p>KQ1 - Which ethical issues does a business need to consider? <u>(a) Ethical Issues</u> -Issues - whistle blowing, disability/gender/sexuality discrimination, use of information, codes of practice, staying safe online, bias -Each of these issues within a business setting, in relation to employees <u>(b) Addressing Issues</u> -For each of the ethical issues</p> <p>KQ2 - Which operational issues does a business need to consider? <u>(a) General Issues</u> -Security of information, health and safety, disaster planning and recovery -How a company must deal with/mitigate each issue. <u>(b) Organisational policies</u> -Policies - Acceptable use policy, code of conduct. -Purpose of each policy <u>(c) Change management</u> -Dealing with the transition or transformation of an organisation's goals, processes or technologies. -Purpose - Implement strategies for implementing, controlling and helping people to adapt to change. <u>(d) Scale of change</u> -Drivers - Change in business practice, legislation, competition. -Needs - improved networking, remote access for employees, efficiency.</p> <p>KQ3 – How can the security of networks be threatened? <u>(a) Threats</u> -Types – Phishing, hacking, virus, Trojan, data interception, eavesdropping, data theft, social engineering <u>(b) Characteristics</u> -Of each type of threat <u>(c) Threat Reduction</u> -Which security method can reduce each risk.</p> <p>KQ4 – How can physical security methods be used to secure computer systems? <u>(a) Types</u> Types – Locks, biometrics, RFID, tokens, privacy screens, shredding <u>(b) Characteristics/Uses</u> Of each type of physical security</p> <p>KQ5 – How can digital security methods be used to secure computer systems? <u>(a) Methods</u> -Anti-virus, firewalls, anti-spyware, username/passwords, permissions, encryption</p>	   	<p>Legislation documentation / articles relating to ethical issues within IT</p> <p>Written explanation of a 'real world' example of an IT related ethical issue</p> <p>Debate/discussion of ethical issues within IT</p> <p>Links to philosophy and ethics – IT related ethical issues</p>



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<p><u>(b) Characteristics</u> -Of each method of digital security</p> <p><u>(c) Use</u> -Of each method, in different contexts -The threats that each method can protect against -Justification of the use of a method</p> <p>KQ6 – How can data devices be disposed of safely?</p> <p><u>(a) Legislation</u> -Environmental Protection Act 1990 -The General Data Protection Regulation (GDPR)/Data Protection Act 1998</p> <p><u>(b) Methods</u> -Purpose -Methods - overwrite data, electromagnetic wipe, physical destruction</p> <p><u>Emerging Digital Practitioner Pathway</u></p> <p>Optional Unit 1 – HT1</p> <p>3 – Cyber Security 8 – Project Management 9 - Product Development 12 - Mobile Technology 17 – Internet of Everything 18 - Computer Systems Hardware</p> <p><u>Application Developer Pathway</u></p> <p>Optional Unit 1 – HT1</p> <p>3 – Cyber Security 8 – Project Management 9 - Product Development 12 - Mobile Technology 15 - Games Design and Prototyping 17 – Internet of Everything 21 - Web Design and Prototyping</p>		
<p>HALF TERM 6:</p> <p><u>All Pathways</u></p> <p>KQ1 – Which individuals and organisations hold information?</p> <p><u>(a) Categories of holders</u> -Categories - Individual citizens, businesses, educational institutions, governments, charities, healthcare services and community organisations. -The information held, in the context of each category.</p> <p><u>(b) Location</u> -Locations - Developing country, developed country, urban, rural, home, workplace. -Access to information and access issues, within each location.</p> <p><u>(c) The global divide</u></p>	   	<p>News articles relating to the 'digital divide'.</p> <p>Within optional unit, pathway dependant</p> <p>Within optional unit, pathway dependant</p> <p>-Links to business studies - How organisations use information. Within optional unit, pathway dependant</p>



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-Comparison of technologies available and access issues across the global divide - between developed and developing countries.

KQ2 - How is information stored?

(a) Types

-Paper-based - Forms, handwritten notes, maps, telephone directories.

-Optical media - CD, DVD, Blu-ray

-Magnetic media - Magnetic hard drives, tapes.

-Solid state media - SSD hard drives, memory cards,

(b) Characteristics/Purpose

-Of each type of storage media

(c) Advantages and disadvantages

-Of each type of storage media, in relation to its characteristics/purpose.

KQ3 - How can information be accessed?

(a) Device Types

-Handheld device - small tablet, smart phone, wearable device, eBook reader.

-Portable devices - laptop, large tablet.

-Fixed devices - desktop computer, smart TV, games consoles.

-Shared devices - database server, data centre, cloud storage devices.

(b) Characteristics/Purpose/Uses

-Of each type of device

(c) Advantages and disadvantages

-Of each type of device, in relation to its characteristics/purpose.

KQ4 - What is the internet and how does it allow us to access data?

(a) The Internet

-A network of interconnected networks, spanning the world

-Internet connections

-Characteristics

(b) Connection types

-Types - copper-cable, optical-fibre, satellite, microwave, mobile data networks.

(c) Characteristics

-Of each network connection type.

-Characteristics - speed, range (distance), storage capacity.

KQ5 - How is the WWW used to share information?

(a) WWW Technologies

-Internet - Public, open access. Anyone can accessed.

-Intranet - Private, closed access. Internal to an organisation.

-Extranet - Private, part shared access. Organisation control/grant external access.

(b) Purpose/characteristics

-Of each network type.

-Comparison of a networks suitability for given uses

-Issues related to access to the network

KQ6 - How can information be presented on the WWW?

(a) Formats

-Webpages - Static and dynamic

-Blogs

-Podcasts

-Streamed audio and video - internet radio, catch-up TV

-Social media channels - Twitter, LinkedIn, discussion boards



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-Document stores - upload and download

-RSS feeds

(b) Purpose

-Of each format

-How well each format can meet the needs of different holders of information, in a range of situations.

KQ7 – What advantages does using the internet have to different holders of information?

(a) Individuals

-Speed of personal communication, easy access to large amounts of information for research, access to internet banking 24/7 etc.

(b) Organisations

-Share large amounts of information quickly between different countries, accept payments 24/7, charity websites accepting donations 24/7 etc.

KQ8 – What disadvantages does using the internet have to different holders of information?

(a) Individuals

-Potential for identity theft, cost of data connection to the internet etc.

(b) Organisations

-Threats caused by malicious attacks, cost of maintaining websites and data stores etc.

Emerging Digital Practitioner Pathway

Optional Unit 1 – HT1

3 – Cyber Security

8 – Project Management

9 - Product Development

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17 – Internet of Everything

18 - Computer Systems Hardware

Application Developer Pathway

Optional Unit 1 – HT1

3 – Cyber Security

8 – Project Management

9 - Product Development

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15 - Games Design and Prototyping

17 – Internet of Everything

21 - Web Design and Prototyping