OCR
Oxford Cambridge and RSA

Cambridge **TECHNICALS LEVEL 2**

IT

Cambridge
TECHNICALS
2016

Unit 1

Essentials of IT

L/615/1324

Guided learning hours: 60

Version 1 September 2016

LEVEL 2

UNIT 1: Essentials of IT

L/615/1324

Guided learning hours: 60

Essential resources required for this unit:
Access to different hardware components
Access to maintenance tools (such as multi-meters)
Access to a variety of software
Computers with internet access

This unit is externally assessed by an OCR set and marked examination.

UNIT AIM

The IT solutions that businesses use in the modern world are made up of many different component parts. These parts can include PCs, PCs that are linked together to form a network, devices and wearable technologies that are attached to the PC or the network via the Cloud and the internet. These business solutions are designed to help businesses to operate.

This unit is the foundation for this qualification and it is designed give you the underpinning synoptic knowledge that will prepare you to study this suite of qualifications. It is a mandatory externally assessed unit for all sizes and pathways within the suite. You will learn about computer hardware and software. You will gain an understanding of how to perform hardware and software maintenance and how to keep safe while you perform these tasks. You will also learn about the benefits to you and businesses of using IT and the internet to help prepare you for a career in the Information Technology sector.

TEACHING CONTENT

The teaching content in every unit states what has to be taught to ensure that learners are able to access the highest grades.
Anything which follows an i.e. details what must be taught as part of that area of content. Anything which follows an e.g. is illustrative.

For externally assessed units, where the content contains i.e. and e.g. under specific areas of content, the following rules will be adhered to when we set questions for an exam:

- a direct question may be asked about unit content which follows an i.e.

- where unit content is shown as an e.g. a direct question will not be asked about that example.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification

1. Know about hardware components	1.1.1 Types of Computer System i.e.:
	  a. PCs
	  b. laptops
	  c. netbooks (e.g. Chromebook)
	  d. mobile devices
	    i. smart phones
	    ii. tablets
	    iii. wearables
	  e. games consoles
	  f. embedded systems
	    i. central heating
	    ii. home appliances
	    iii. Internet of Things
	1.1.2 Types of network i.e.:
	  a. local area network (LAN) (e.g. peer to peer and client server)
	  b. wireless local area network (WLAN)
	1.1.3 Types of connectivity methods i.e.:
	  a. wired
		Learners should know about different types of computer system. They should be familiar with new types of devices that don't feature internal storage. Learners should also have a knowledge of embedded systems, particularly in relation to the Internet of Things.
		
		Learners should know about different types of networks, connectivity methods and network topologies. They should also be able to identify different networking protocols and state their use.
		
		Learners should know how to extend acronyms of certain terms into their full form.

Learning outcomes	Teaching content	Exemplification
The Learner will:	Learners must be taught:	

	b. wireless
	1.1.4 Types of topologies i.e.:
	 a. bus
	 b. ring
	 c. star
	 d. mesh
	1.1.5 Types of network protocols i.e.:
	 a. TCP
	 b. IP
	 c. DHCP
	 d. Ethernet
	 e. HTTP
	 f. FTP
	 g. Use
	1.1.6 Computer components i.e.:
	 a. motherboard
	 b. memory
	  i. RAM
	  ii. ROM
	  iii. Cache
	 c. processor
	 d. storage
	  i. internal
	  ii. external
	  iii. removable
	  iv. solid state
	  v. flash
	  vi. hybrid
		Focussing on the PC itself, learners should be able to identify the components as listed and know how they are used. They should know the purpose and characteristics of different storage and control technologies.

Learning outcomes	Teaching content	Exemplification
The Learner will:	Learners must be taught:	

	vii. optical
	    viii. cloud
	  e. control cards
	    i. NIC Network Interface Cards)
	    ii. sound cards
	    iii. video cards
	  f. power supply unit (PSU)/battery
	  g. connectivity ports
	    i. USB
	    ii. firewire
	    iii. network
	    iv. VGA
	    v. HDMI
	    vi. DVI
	    vii. display port
	  h. purpose of different storage and control technologies
	  i. characteristics of different storage and control technologies
	1.1.7 Devices i.e.:
	  a. mouse
	  b. keyboard
	  c. graphics tablet
	  d. microphone
	  e. scanner
	  f. speakers
	  g. headphones (without microphone)
	  h. printer
		Learners should be able to identify different output and input devices and which could be both (hybrid).
		
		Learners should know about the purpose and common features of the devices listed.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification

	i. 2D
	     ii. 3D
	i. plotter
	j. touch screen
	k. GPS receiver
	l. dongle
	m. networking components
	     i. hubs
	     ii. routers
	     iii. switches
	n. purpose of devices
	o. features of devices
	1.1.8 Fault diagnosis i.e.:
	a. using POST
	     i. the role of beep codes
	     ii. the role of BIOS
	     iii. the POST process
	b. using Device Manager
	c. using Task Manager
	d. using Update Manager
	e. purpose of these diagnostic tools
		Learners should know the purpose of POST, the Device Manager, the Task Manager and the Update Manager.
		
		Learners should know the role of beep codes and that different OS may have different beep configurations, although they are not expected to know the meaning of individual beep codes.

2. Know about software components	2.1.1 Types of operating or systems software i.e.: a. Windows b. Linux c. Mac OS d. Google Chrome e. IOS	Learners should know the major operating systems and give examples of their use. Learners must also be aware of new and emerging operating systems which may feature in the external assessment.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification

	f. Tizen OS
	    g. Android
	    h. new and emerging operating or systems software
	    i. examples of their use
	2.1.2 Functions of operating systems i.e.:
	    a. manages resources
	    b. organises how memory is used
	    c. controls storage media
	    d. controls peripherals
	    e. organises processing time
	    f. manages security and user access
	2.1.3 Types of application software i.e.:
	    a. business and personal productivity
	       i. email
	       ii. text-based documents
	       iii. spreadsheet
	       iv. database
	    b. business
	       i. CAD/CAM
	       ii. CRM
	    c. web browsers
	    d. development
	       i. complier
	       ii. debugger
	    e. multimedia
	       i. presentation
	       ii. audio
		Learners should be able to identify some of the functions of an operating system
		
		Learner should know the basic applications software used on PCs and be able to provide examples (such as CRM software – Customer Relationship Management, or CAD/CAM for manufacturing).
		
		Learners should also know that all applications (including bespoke) can be developed for specific tasks and uses.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification

	iii. video
	iv. animation
	  f. leisure
	     i. games
	     ii. hobbies
	  g. uses of application software
	2.1.4 Types of apps i.e.:
	  a. differences between an app and an application
	  b. communication (e.g. Interoffice)
	  c. mobile (e.g. for Apple and Android)
	  d. game
	  e. multi-platform (e.g. Tripadvisor's web interface)
	  f. features of different types of app
	  g. limitations
	2.1.5 Functions of utility software i.e:
	  a. system monitoring
	     i. task manager
	     ii. event viewer
	     iii. performance monitor
	  b. backup tools
	     i. operating system backup
	     ii. third party back tools
	  c. system upkeep
	     i. disk drive clean-up
	     ii. compression
	     iii. defragmentation
	  d. troubleshooting tools
	     i. hardware
		Learners should know what the differences are between an app and application and identify features of different types of app.
		
		Learners should also know why some app content needs to be formatted for different platforms and what the consequences are of trying to use the same content on different devices without modification.
		
		Learners should know about the functions of different types of utility software.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification

	ii. software – debugger, compiler, integrated
	iii. development environment (IDE)
	  system
	e. formatting (e.g. preparation of hard drive,
	  removal of all system files)
	  i. initialisation
	  ii. file systems
	  iii. risks
	f. security
	  i. firewall
	  ii. encryption	

3. Know how to install and upgrade hardware and software	3.1.1 Installation/upgrade procedures i.e.:
	a. identifying need for installation or upgrade (patching in respect of software)
	b. investigating possible solution
	c. deciding on most appropriate solution
	d. planning installation/upgrade
	  i. confirm compatibility
	  ii. select tools or resources
	  iii. identify health and safety requirements
	  iv. prepare test plan
	  v. ensure system is backed up
	  vi. implement the installation or upgrade safely
	e. recording and documenting activities
	f. user acceptance testing
		Learners should have an appreciation of the general order of procedures (for example, confirming compatibility before implementing an installation or upgrade, or making sure that the system has been backed up before taking action).
		
		Learners should know the importance of recording changes made to systems, whether that is installation of new hardware or software upgrading or patching.
		
		Learners should be able to list the types of information that should be recorded.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification

	3.1.2 Individual health and safety responsibilities i.e:
	    a. reporting anything unsafe
	    b. following health and safety policies
	    c. using correct personal safety equipment
	        i. when to use safety equipment provided by an organisation
	    d. using tools correctly
	    e. using correct health and safety practice when handling hardware
	3.1.3 Organisational responsibilities i.e.:
	    a. providing suitable personal safety equipment
	        i. safety shoes
	        ii. safety glasses
	        iii. anti-static wrist band
	        iv. anti-static mat
	        v. correct use
	    b. providing training before using tools and equipment
	    c. providing a suitable working environment
	    d. providing suitable medical screening
	        i. sight checks
	        ii. hearing checks
	    e. carrying out risk assessments
		Learners should know about and be able to give examples of both individual and employer considerations around health and safety.
		
		They should know the correct use of PSE equipment typically used by technical staff/provided by an organisation and be able to identify situations when PSE is necessary.

4. Know about the use of the World Wide Web (WWW)	4.1.1 Uses of the internet i.e.:
	    a. communication
	        i. email
	        ii. messaging
		Learners should know about the use of the world wide web for the activities listed. They should be able to identify the benefits of using the world wide web for each activity.

Learning outcomes	Teaching content	Exemplification
The Learner will:	**Learners must be taught:**	

	iii. VoIP
	    iv. video call
	  b. leisure
	    i. gaming
	    ii. social media
	    iii. music/film streaming
	  c. research
	    i. education
	    ii. scientific research
	  d. retail
	    i. online shopping
	    ii. travel concerts
	  e. personal finance
	    i. banking
	    ii. savings
	    iii. insurance
	  f. benefits of using the web for these purposes
	  g. risks
	    i. virus
	    ii. phishing
	    iii. identify theft
	    iv. minimising risks
	4.1.2 Types of cloud related activities i.e.:
	  a. music and film streaming
	  b. file sharing
	  c. remote access
	  d. storage and accessibility
	  e. disaster recovery
		Learners should also know some of the risks associated with using the world wide web and how these can be minimised.
		
		Learners should know about the main activities enabled by the 'cloud'.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification

	4.1.3 Types of social media sites
	   a. business networking sites (e.g. LinkedIn, Ryze, Talkbiznow, Biznik, E.Factor)
	   b. personal networking sites (e.g. FaceBook, Twitter, Pintrest)
	   c. features of social media sites
	   d. uses of social media sites
	      i. communication
	      ii. marketing
	      iii. file-sharing
	4.1.4 Emerging technologies i.e.:
	   a. lifestyle and health
	      i. fitness tracking
	      ii. health monitoring
	   b. artificial intelligence
	      i. medical diagnostics
	      ii. scientific exploration
	   c. virtual and augmented reality
	      i. entertainment
	      ii. training
	   d. features of these technologies
	   e. new and emerging technologies
		Learners should know about the main social media sites and the features of these sites. They should also know about the type of activity that is the focus of activity on these sites.
		
		Learners should know about the different contexts which support emerging technologies and some of the features of these technologies.
		
		Learners must also be aware of new and emerging technologies in the IT sector.

5. Know about the benefits of using IT in business	5.1.1 Different types of operational activity i.e.:
	   a. data collection
	      i. software tools
	      ii. bias validity
	   b. data storage
		Learners should be aware of different operational activities so they can demonstrate knowledge of the role IT plays.
		
		They should know the benefits of using IT to support the listed operational activity.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification

	i. software tools
	     ii. cost
	  c. data processing
	  d. benefits of using IT to support operational activity
	5.1.2 Working with others i.e.:
	  a. communication
	       i. telephone
	     ii. video call
	    iii. text message
	    iv. online chat
	  b. collaboration and sharing
	       i. screen sharing
	     ii. teleconference
	    iii. video conference
	  c. remote working
	       i. software tools
	  d. benefits of using IT to work with others
	5.1.3 Using IT to support business activities i.e.:
	  a. forecasting
	  b. analysing
	       i. data capture
	     ii. software tools
	  c. marketing
	       i. software tools
	     ii. social networking
	    iii. customer engagement
	  d. project management
		Learners should know how IT supports employees in working with others when communicating, collaborating or sharing ideas or working in a remote capacity.
		
		Learners should know about some of the benefits of using IT when working with others.
		
		Learners should know about how IT can be used in different ways to support a range of different business activities and the advantages as well as the disadvantages that come from this.

Learning outcomes	Teaching content	Exemplification
The Learner will:	Learners must be taught:	

	i. software planning
	    ii. time management
	    iii. monitoring progress
	e. presenting
	    i. presenting to colleagues, company, customer
	f. how the use of IT can benefit these business activities
	g. the disadvantages of using IT in support of business activities
	    i. employee knowledge of software
	    ii. compatibility issues	

LEARNING OUTCOME (LO) WEIGHTINGS

Each learning outcome in this unit has been given a percentage weighting. This reflects the size and demand of the content you need to cover and its contribution to the overall understanding of this unit. See table below:

LO1	22.5%
LO2	25%
LO3	20%
LO4	20%
LO5	12.5%

ASSESSMENT GUIDANCE

All LOs are assessed through externally set online examination papers worth a maximum of 40 marks and are 45 minutes in duration.
This unit provides the underpinning knowledge to support other units in the qualification. Learners should study the basics of computer hardware and software, installation and upgrading practices, the use of the world wide web and the benefits of using IT in business.

Exam papers for this unit will include multiple choice question types including reordering statements, true and false questions, linking boxes and selecting multiple responses.

Some providers for the industry qualifications offer quizzes, tests and assessments. Reference to these websites may support knowledge and learning:

www.comptia.org
www.cisco.com/uk

SYNOPTIC ASSESSMENT

It will be possible for learners to make connections between other units over and above the unit containing the key tasks for synoptic assessment, please see section 6 of the centre handbook for more detail. We have indicated in this unit where these links are with an asterisk and provided more detail in the next section.

Links between this unit and other units

This unit and specific LO	Name of other unit and related LO
LO1 - Know about hardware components.	Unit 3 Building IT Systems - LO2, LO3, LO4 Unit 5 - Creating Business Solutions – LO2, LO3 Unit 8 Using Emerging Technologies – LO1, LO3 Unit 9 Supporting IT Functions - LO2, LO4 Unit 11 IT Hardware Installation and Upgrade – LO1, LO2 Unit 12 Creating a Computer Network - LO1 Unit 18 Creating Visual Products – LO2

This unit and specific LO	Name of other unit and related LO
LO2 - Know about software components.	Unit 3 Building IT systems – LO2, LO3, LO4 Unit 4 Creating programming solutions for business – LO2, LO3, LO4 Unit 5 Creating business solutions – LO2, LO3 Unit 8 Using emerging technologies – LO1, LO3 Unit 9 Supporting IT functions – LO3 Unit 10 IT software installation and upgrade– LO1, LO2 Unit 12 Creating a computer network – LO1, LO2, LO4 Unit 14 Creating mobile applications for business - LO2, LO3 Unit 15 Games creation - LO2, LO3, LO4 Unit 17 Using data analysis software – LO2 Unit 18 Creating visual business products - LO2, LO3, LO4
LO3 - Know how to install and upgrade hardware and software.	Unit 3 Building IT systems – LO3, LO4 Unit 4 Creating programming solutions for business – LO3, LO4 Unit 10 IT Software installation and upgrade- LO1, LO2, LO3 Unit 11 IT Hardware installation and upgrade - LO2, LO3 Unit 12 Creating a computer network - LO1, LO2, LO3, LO4 Unit 15 Games creation – LO2, LO3, LO4
LO4 - Know about the use of the World Wide Web (WWW).	Unit 4 Creating programming solutions for business – LO3, LO4 Unit 5 Creating business solutions – LO3 Unit 8 Using emerging technologies - LO1, LO2, LO3 Unit 13 Creating websites - LO1 Unit 12 Creating a computer network – LO1, LO3, LO4 Unit 13 Creating websites, LO2, LO3 Unit 14 Creating mobile applications for business – LO1, LO2 Unit 15 Games creation – LO1, LO2, LO4 Unit 16 Using social media channels for business - LO1

This unit and specific LO	Name of other unit and related LO
LO5 - Know about the benefits of using IT in business.	Unit 2 Essentials of cyber Security - LO1
	Unit 4 Creating programming solutions for business – LO2, LO3
	Unit 5 Creating business solutions – LO2, LO3,
	Unit 6 Participating in a project - LO1, LO2
	Unit 7 Pitching a product – LO1, LO2, LO3
	Unit 8 Using emerging technologies LO2, LO3
	Unit 12 Creating a computer network - LO3
	Unit 13 Creating websites – LO1, LO2, LO3, LO4
	Unit 14 Creating mobile applications for business – LO1, LO2, LO3
	Unit 16 Using social media channels for business – LO1, LO3, LO3
	Unit 17 Using data analysis software - LO1, LO2, LO3, LO4
	Unit 18 Creating visual business products – LO1, LO2, LO3, LO4

LO	Vendor qualification	Content link
LO1	Cisco ITE	Part 1.1 - Fundamentals - Introduction to the Personal Computer
		Part 1.6 - Fundamentals - Fundamental Laptops and Portable Devices
		Part 1.7 - Fundamentals - Fundamental Printers and Scanners
LO2	Cisco ITE	Part 1.5 - Fundamentals - Fundamental Operating Systems
LO3	Cisco ITE	Part 1.2 - Fundamentals - Safe Lab Procedures and Tool Use
		Part 1.4 - Fundamentals - Basics of Preventive Maintenance and Troubleshooting
LO1	CompTIA IT Fundamentals	2.0 – Hardware/4.0 - Networking
LO2	CompTIA IT Fundamentals	1.0 – Software/3.0 Security
LO1	CompTIA A+	220 - 901 Exam – 1.0 Hardware/2.0 – Networking/3.0 - Mobile Devices
LO2	CompTIA A+	220 – 902 Exam – 1.0 Windows Operating Systems/2.0 – Other Operating Systems and Technologies/3.0 - Security
LO3	CompTIA A+	220 - 901 Exam – 1.0 Hardware/2.0 Networking/3.0 – Mobile Devices/5.0 Organisational Procedures

MEANINGFUL EMPLOYER INVOLVEMENT - a requirement for Technical Certificate qualifications

These qualifications have been designed to be recognised as Technical certificates in performance tables in England. It is a requirement of these qualifications for centres to secure for every learner employer involvement through delivery and/or assessment of these qualifications.

The minimum amount of employer involvement must relate to at least one or more of the elements of the mandatory content. This unit is a mandatory unit in all the specialist pathways.

Eligible activities and suggestions/ideas that may help you in securing meaningful employer involvement for this unit are given in the table below.

Please refer to the *Qualification Handbook* for further information including a list of activities that are not considered to meet this requirement.

Meaningful employer engagement	Suggestion/ideas for centres when delivering this unit
1. Learners undertake structured work-experience or work-placements that develop skills and knowledge relevant to the qualification.	Learners could undertake work experience in an organisation with an IT function. A work diary could be kept, documenting the tasks undertaken by the learner, to include hardware maintenance, troubleshooting etc. and mapped to the learning outcomes of this and other units.
2. Learners undertake project(s), exercises(s) and/or assessments/examination(s) set with input from industry practitioner(s).	Learners could be given computer equipment to perform maintenance on. Industry practitioners could visit the school for a workshop and create known faults in computer equipment. Learners could use correct process to identify faults (using relevant personal safety equipment), document their findings, plan how to rectify the fault and perform maintenance.
3. Learners take one or more units delivered or co-delivered by an industry practitioner(s). This could take the form of master classes or guest lectures.	See 2.
4. Industry practitioners operating as 'expert witnesses' that contribute to the assessment of a learner's work or practice, operating within a specified assessment framework. This may be a specific project(s), exercise(s) or examination(s), or all assessments for a qualification.	N/A

You can find further information on employer involvement in the delivery of qualifications in the following documents:

- [Employer involvement in the delivery and assessment of vocational qualifications](#)

- [DfE work experience guidance](#)

To find out more
ocr.org.uk/it
or call our Customer Contact Centre on **02476 851509**

Alternatively, you can email us on **vocational.qualifications@ocr.org.uk**