



Accredited

OCR LEVEL 3 CAMBRIDGE TECHNICAL CERTIFICATE/DIPLOMA IN IT

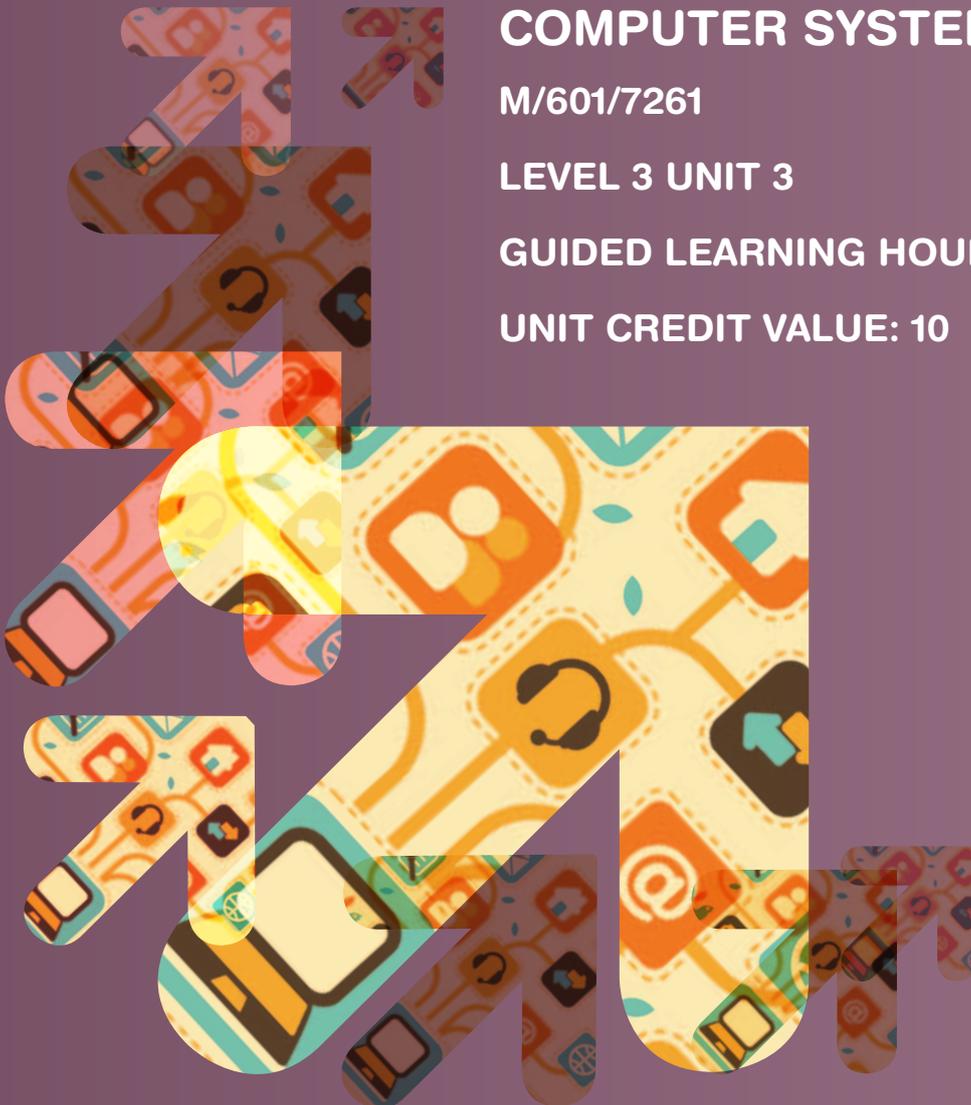
COMPUTER SYSTEMS

M/601/7261

LEVEL 3 UNIT 3

GUIDED LEARNING HOURS: 60

UNIT CREDIT VALUE: 10



COMPUTER SYSTEMS

M/601/7261

LEVEL 3 UNIT 3

AIM OF THE UNIT

The purpose of this unit is to prepare the learners to undertake part of the role of IT technician. They will investigate a range of hardware components including looking at the technical specifications and how the components work together in a computer system. They will explore at least two types of operating systems and software utility programmes. With the knowledge gained from investigating the components and software the learners will be required to recommend a range of systems to meet different user needs.

The learners will be expected to have the opportunity to practice the installing hardware and software components, configuring the systems to meet the user's needs and to test the systems. This unit aims to give learners an understanding of the different components in a computer system and the skills to be able to recommend, set up and maintain computer systems for business use.

ASSESSMENT AND GRADING CRITERIA

Learning Outcome (LO) The learner will:	Pass The assessment criteria are the pass requirements for this unit. The learner can:	Merit To achieve a merit the evidence must show that, in addition to the pass criteria, the learner is able to:	Distinction To achieve a distinction the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
1 Understand the components of computer systems	P1 explain the function of computer hardware components	M1 compare the different backing storages available	
	P2 explain the purpose of operating systems		
	P3 explain the purpose of different software utilities		D1 explain how the performance of computer systems can be improved with the use of software utilities
2 Be able to recommend computer systems for a business purpose	P4 recommend a computer system for a given business purpose	M2 justify how final recommendations meet a given business purpose	
3 Be able to set up and maintain computer systems	P5 set up a standalone computer system, installing hardware and software components		
	P6 configure a computer system to meet user needs		D2 recommend computer system improvements based on feedback from users
	P7 test a configured computer system for functionality	M3 analyse the test results identifying any discrepancies	
	P8 undertake routine maintenance tasks on a standalone computer system		

TEACHING CONTENT

The unit content describes what has to be taught to ensure that learners are able to access the highest grade.

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, it should be noted that where e.g. is used, learners must know and be able to apply relevant examples to their work though these do not need to be the same ones specified in the unit content.

LO1 Understand the components of computer systems

- **internal system unit components:**
 - processors
 - motherboards
 - BIOS
 - hard drive configuration and controllers (e.g. SATA, IDE, master, slave)
 - ports e.g. USB, parallel, firewire
 - internal memory (e.g. RAM, ROM, cache)
 - specialized cards (e.g. network, graphic cards, sound).
- **peripheral devices:**
 - output devices (e.g. monitor, printer, speakers)
 - input devices (e.g. camera/webcam, scanner, microphone)
 - cabling (e.g. optical, twisted pair).
- **backing storage options:**
 - types (e.g. disks, pen drives, optical media, flash memory cards, portable and fixed drives)
 - performance factors (e.g. security, capacity, transfer rate).
- **operating systems:**
 - operating system examples (e.g. LINUX, Windows, MAC OS)
 - visual OS (e.g. command line, GUI)
 - operating system functions (e.g. system management, security)
 - file management
 - device drivers
 - features (e.g. customisation, connectivity, stability and reliability, cost, ease of use).
- **software utilities:**
 - security (e.g. virus protection, firewalls, access, permissions)
 - defragmentation
 - housekeeping
 - drive formatting
 - other.

LO2 Be able to recommend computer systems for a business purpose

- **considerations:**
 - cost; (e.g. financial, time, user)
 - understanding user requirements (e.g. software, network sharing, maintenance, outputs, integration, accessibility, experience, level of understanding, training, special requirements e.g. user has physical limitations)
 - storage
 - accessibility.

LO3 Be able to set up and maintain computer systems

- equipment (e.g. monitor, printer, modem/router, keyboard, mouse, speakers, microphone, camera).
- components (e.g. graphics, memory, sound cards, CD/DVD drive, network card).
- **software:**
 - operating system software (e.g. Windows; Linux, MacOS)
 - applications software (e.g. Office Software suites)
 - security software (e.g. virus checkers, firewalls)
 - device drivers.
- **configuration:**
 - BIOS configuration (e.g. setting a BIOS password, editing power management options)
 - anti-virus configurations;
 - desktop customisation (e.g. background, size, icons and shortcuts)
 - start-up options and logon/access permissions;
 - customising application toolbars.
- **testing:**
 - test plan/table for accuracy and functionality (e.g. software applications, default folder settings, shortcuts, drivers)
 - user feedback
 - acceptance

- forward planning
- amendments.
- **routine maintenance tasks:**
 - organisation, naming, deletion and archiving of files
 - back-up procedures
 - defragmentation
 - deleting temporary files
 - cleaning hardware
 - replacing consumables (e.g. printer paper, toner cartridges).

DELIVERY GUIDANCE

The unit should be delivered predominantly within a workshop environment, giving the learners exercises, practical activities or case studies. Learners may already have a variety of experience in installing hardware and this experience could contribute to the group discussions and teaching of this unit.

Understand the components of computer systems

To introduce the unit the tutor should provide brief presentations on the different areas in learning outcome 1. The areas would be internal system components, peripherals, backing storage, operating systems and software utilities. The learners should then explore, investigate and analyse these areas including any of the new technologies. This could be done as groups taking one topic each and reporting back giving examples or purpose, options and usage identifying these to the group. Learners should experience other operating systems besides Microsoft Windows, this may be through alternative technologies such as mobile devices or research but they should be able to compare and understand the differences. These activities could lead to the creation of a manual, leaflet or guide on the various devices and software, to be presented to the wider group.

Be able to recommend computer systems for a business purpose

With their knowledge and understanding from Learning outcome 1 and using discussions or debates, which can be tutor led, the learners must understand the considerations that must be made when selecting computer systems for a business purpose. Learners should be given a variety of case studies in which they have to devise questions which support the decision making process for the creation of the most appropriate system, comparing the good and bad points of a given system for a business and recommend improvements. When planning to create a system, learners should look at both commercially available computer systems as well as building a system from individual components and understand the parameters and constraints e.g. time, budget. They should plan systems to defined specifications then compare these with others in the group to identify alternatives or improved options. This will lead them to consider all options and alternative solutions.

Be able to set up and maintain computer systems

This will need to be delivered allowing learners extensive "hands-on" practical experience with as many installations of hardware and software components as possible to underpin the knowledge they have already gained. The tutor must ensure that learners are given a detailed understanding of the Health and Safety issues arising from working in this environment and the learners will need to be taught and also demonstrate how to work in a safe manner, using anti-static mats, wristbands, and anti-static bags appropriately including using the tools safely. The learning environment should have health and safety procedures in place for those working in the IT area; these are a good starting point for this type of activity.

Once health and safety requirements in the environment have been demonstrated successfully by the learners they should start working with standalone machines that are obsolete or damaged beyond economical repair, this will give them the opportunity to develop their skills before progressing onto fully functional machines.

Learners should be taught the importance of and the requirements for, developing plans to record the testing and test results resulting from work undertaken on the computer system. Good practice in planning and recording the system testing should be developed as the practical work progresses. The learners should also then deliver to the user and seek feedback and user acceptance for the work they have carried out. This will also allow them to identify areas for consideration that they may have missed.

Tutors should provide learners with the opportunity to work with at least 2 different types of operating systems. The learners will need to investigate a range of software utilities; this should be delivered to ensure they are familiar with virus protection and firewalls, part of which would involve looking at the latest threats and barriers. If this is not possible, experience of software utilities may be delivered using clean-up tools on a system but tutors must ensure that the learners gain a full understanding of the range and functions of these tools through individual and group research and discussions.

SUGGESTED ASSESSMENT SCENARIOS AND TASK PLUS GUIDANCE ON ASSESSING THE SUGGESTED TASKS

Assessment Criteria P1, P2, M1

Learners need to show understanding of the components of a computer system. This could be evidenced in the form of a detailed user guide explaining the functions of computer components. The evidence could include the learner providing photos, video recordings (separately), images or diagrams with clear descriptive notes of the functions for each component.

Learners must give a basic outline of the functions of operating systems in general and explain their purpose in managing the computer components. This could be evidenced with a report which compares different types of operating systems and the purpose of their different features.

For merit criterion M1 the learner must show that they have compared the features and functions of different backing storages in addition to the strengths and weaknesses. The learners must look at different types of storage and consider how much storage is available, transfer rates, suitability for different systems, security issues, costs. This could be evidenced in a report format.

Assessment Criteria P3, D1

Learners should consider a range of different software utilities and their findings could be presented in a table; they must include at least two examples from each category of software utility:

security,
clean up tools,
drives formatting

and must also include a rationale explaining why the software is fit for an identified purpose.

For distinction criterion D1 the learners must produce evidence that they have considered the benefits of software utilities and identified how these utilities will improve the performance of computer systems. This can be an extension of P3 where learners have explained why the software would be used for a purpose. This could be presented in the form of a report or a table with explanatory notes and each improvement will need to be detailed and clearly linked to a business purpose.

Assessment Criteria P4, M2

Learners must be given a detailed scenario or specification from which they are able to identify client requirements to recommend at least two computer systems including the software which meets an identified business purpose. These assessment criteria could be evidenced independently to other areas within the unit and will give the learner the opportunity to include the more unusual components or software.

The learners recommendations for the computer system could be presented as a report, table or presentation that shows their choice of components and includes them making reference and consideration to the business purpose. The recommendations made must include all the hardware and software components that are needed for the system to work.

For merit criterion M2 learners will need to justify which one system from the two options investigated they will recommend to the user. The justifications for their recommendation need to be clearly presented with reference to the user's needs. This could be evidenced by a report or an annotated specification document.

Assessment Criteria P5, P6, P7, P8, M3, D2

The learner needs to install and set up a system using hardware and software to meet the requirements of a specified end user. The recommendations made by the learner previously would be ideal for this assignment but this may not be possible. So another scenario or specification would be an option for learners.

Learners must show that they have installed at least five hardware and five software components on the stand alone system. This could be evidenced with witness statements, annotated photographs, written worksheets and video recordings supported by learner documentation. Learners must evidence that they have used suitable safety precautions.

Learners must provide evidence of configuring the system to meet the requirements of the identified end user. These could include: mouse buttons, screen resolution, shortcuts, themes, fonts, default language, default folder location or power saving options. This could be evidenced with witness statements, annotated photographs and screenshots, video recordings or worksheets supported by the learners explanations for the configurations.

The learner must evidence that they have tested the configured system for functionality. This must include the use of a test plan/table which shows the tests, the rationale for the choice of tests, expected outcomes, actual outcomes and the results of testing. They should include the retesting of any failures this could be supported by annotated before and after screenshots in evidencing the results of testing.

The learner must also show they have carried out routine maintenance tasks on a computer system. This could be evidenced in the form of a report together with annotated screenshots to evidence the maintenance activities. The learner must provide evidence of performing at least three different routine maintenance tasks identified in the teaching content.

For merit criterion M3 the learners must show a detailed analysis of their completed tests against the expected results, identifying any discrepancies and how they were resolved. This could be an extension of their test plan/table with discussion on the differences and discrepancies. Iterative tests and changes documented by the learner would also support their work.

For distinction criterion D2 the learners will need to obtain feedback from user(s) which include consideration for the suitability of the system, any issues that need to be resolved and any improvements the user(s) would like. The learner could then provide evidence in the form of a report which details the result of the feedback including the reasons for the improvements requested. Feedback forms or documentation could also support the learners evidence.

MAPPING WITHIN THE QUALIFICATION TO THE OTHER UNITS

Unit 5 Organisational system security

Unit 7 Computer networks

Unit 11 Maintaining computer systems

LINKS TO NOS

4.1 Systems Architecture

5.1 Systems Development

5.5 IT/Technology systems installation, implementation and handover



CONTACT US

Staff at the OCR Customer Contact Centre are available to take your call between 8am and 5.30pm, Monday to Friday.

We're always delighted to answer questions and give advice.

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