Systems and Principles Unit Syllabus

Level 2 Install and configure ICT equipment and operating systems

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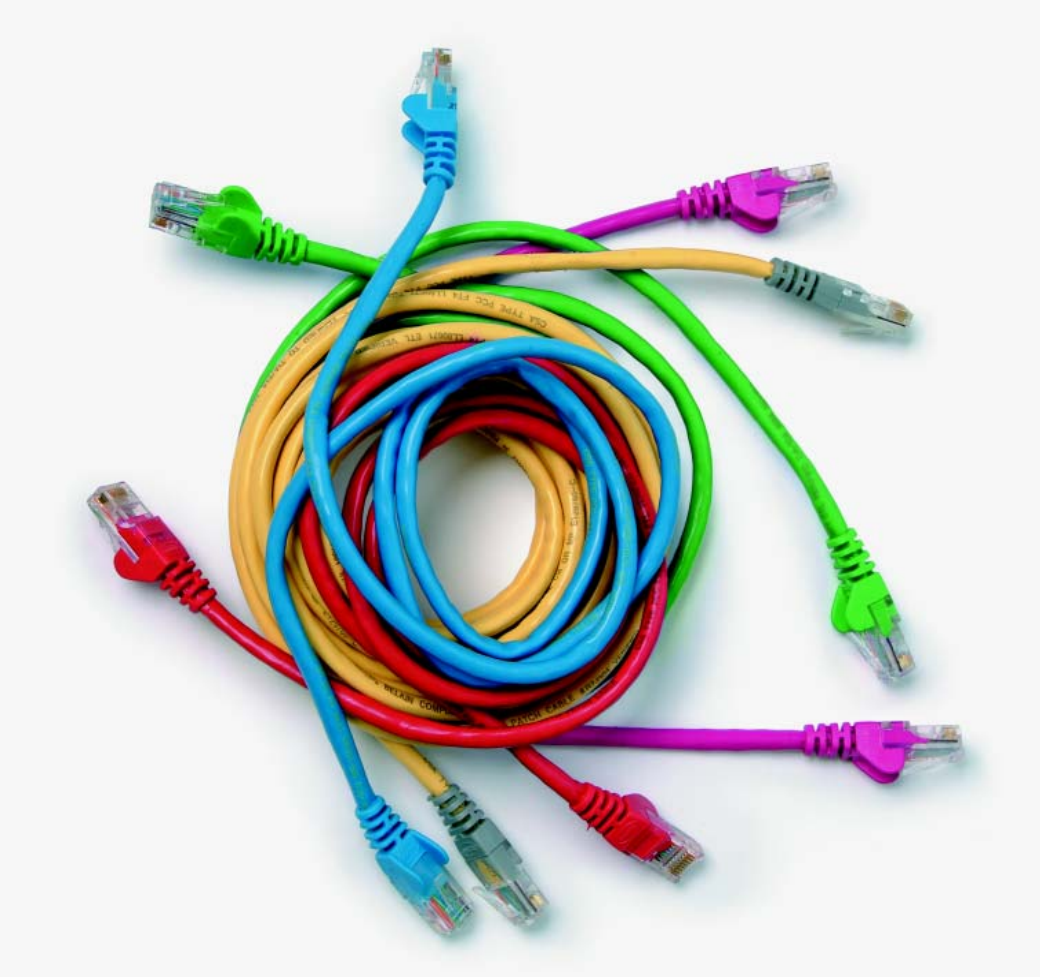

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Unit 229 Install and configure ICT equipment and operating systems

Syllabus Overview

Rationale

This unit develops the skills required for candidates to install and configure hardware and systems software to stand-alone or networked PCs.

Learning outcomes

There are **five** outcomes to this unit. The candidate will be able to:

- Prepare hardware/equipment for installation
- Install and configure hardware/equipment
- Test installed hardware/equipment
- Prepare, carry out and document the installation and upgrade of an operating system
- Configure and test an installed operating system

Guided learning hours

It is recommended that 60 hours should be allocated for this unit. This may be on a full time or part time basis.

Assessment and grading

Assessment will be by means of a **set assignment** covering both practical activities and underpinning knowledge.

Unit 229 Install and configure ICT equipment and operating systems

Outcome 1 Prepare hardware/equipment for installation

Practical activities

1 prepare the work area to carry out a hardware installation

2 prepare hardware/equipment for installation eg

- a base unit including system board, CPU, RAM, drives, expansion cards
- b monitor
- c printer
- d scanner
- e keyboard/mouse

3 check that the hardware/equipment for installation is undamaged

4 check that the individual elements of hardware/equipment are compatible with each other and any existing equipment

5 check that the correct tools/resources are available to carry out the installation

6 produce reports on any problems encountered.

Underpinning knowledge

The candidate will be able to:

1 describe common safety factors to consider when installing a computer

2 describe the steps that are necessary to prepare the work area according to health and safety standards

3 state the physical checks to be made when unpacking hardware/equipment eg

- a broken security seals
- b damaged packaging
- c other indicators of possible damage to equipment

4 explain common problems and consequences which could arise from incorrect packaging and handling eg

- a visible damage
- b unseen damage to electronic parts
- c delays in completion of installation
- d customer dissatisfaction
- e increased support costs

Underpinning knowledge continued

5 explain common checks to be made for compatibility of ICT hardware/equipment eg
   a interface type
      i serial
      ii parallel
      iii SCSI
      iv EIDE
      v SATA
      vi USB
      vii Firewire
   b connector type
   c processor and RAM
   d revision levels
      i firmware
      ii hardware
   e power supply
6 list types of hardware/equipment which need antistatic packaging and handling precautions eg
   a printed circuit boards (PCBs)
   b various drives
   c RAM
   d CPU
7 identify the tools/resources required to carry out an installation
8 state why it is important to report and record any damage/problems eg
   a reduce recurrence of the problem
   b provide an audit trail
   c identify potential design deficiencies
9 describe how effective technical support can improve levels of customer satisfaction
10 describe the importance of effective communication with external providers of technical support.

Unit 229 Install and configure ICT equipment and operating systems

Outcome 2 Install and configure hardware/equipment

Practical activities

The candidate will be able to:

1 install hardware/equipment in both stand-alone and networked configurations eg
   - a base unit including system board, CPU, RAM, drives, expansion cards
   - b monitor
   - c printer
   - d scanner
   - e keyboard/mouse

2 check that the hardware/equipment installation meets product and safety requirements

3 configure hardware/equipment according to manufacturers instructions

4 identify any problems with the installation eg
   - a cabling
   - b cooling
   - c related to ergonomics

5 set-up and configure hardware according to user/organisational requirements

6 produce records of the installation

7 identify the severity and priority of incidents and problems

8 use professional and ethical standards while working.

Underpinning knowledge

The candidate will be able to:

1 describe the function of external and internal hardware required to build a complete computer system

2 list common physical problems that can occur with installation of ICT hardware/equipment eg

- a position of equipment
- b supply and voltages of electricity
- c environmental conditions
- d failure to remove shipping protection devices
- e faulty connecting cables
- f equipment damaged in transit

3 explain specific safety factors for self and others to consider when installing hardware/equipment eg

- a manual handling
- b electrical hazards
- c positioning of equipment
- d routing of cables
- e ventilation of equipment
- f electrostatic hazards
- g differences between standard mains and three phase power
- h use of appropriate tools

4 explain common types of faults which can occur when installing and configuring hardware/equipment eg

- a failure
- b wrong jumper configuration

5 describe steps that can be taken to satisfy user/organisational requirements eg

- a customise operating system and application software configuration
- b customise hardware configuration to user requirements

6 explain the reasons for keeping records of installation and configuration of hardware

7 state the importance of complying with relevant legislation and regulations

8 state what is meant by:

- a technical support
- b a patch
- c a release
- d an infrastructure refresh programme

Underpinning knowledge continued

9 identify
   a the customers
   b external providers of technical support
   c who needs to authorise actions during technical support
   d who may be affected by a particular incident, problem or change
10 describe how to comply with standards and service levels that apply to technical support
11 describe how to source, gather and collate information from external sources about resolutions and fixes
12 analyse and interpret relevant information about
   a technical infrastructure and services requiring support
   b incoming incidents, problems and change requests.

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Outcome 3 Test installed hardware/equipment

Practical activities

The candidate will be able to:

1 prepare hardware test plans from a standard testing procedure

2 use various tools to confirm correct function of installed hardware prior to installation of applications software eg

- a third party software
- b various hardware tools
- c different OS tools
- d anti-virus software

3 test hardware/equipment following installation

4 identify and resolve failures from POST indications

5 produce test reports following an installation

6 communicate effectively, courteously and efficiently with

- a external contacts who provide technical support
- b internal and external contacts in response to incidents and customer requests.

Underpinning knowledge

The candidate will be able to:

1 describe different methods of testing hardware/equipment

2 explain the purpose of testing hardware/equipment

- a following installation
- b in response to an identified problem

3 state the function of tools and equipment that can be used to test hardware

4 state the difference between the terms ‘benchmark’ and ‘actual’ performance

5 state factors that can cause hardware/equipment not to perform as expected

6 identify actions to be taken on completion of testing eg

- a submitting test report
- b reporting identified errors
- c escalation
- d following maintenance procedures.

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Outcome 4 Prepare, carry out and document the installation and upgrade of an operating system

Practical activities

The candidate will be able to:

1 prepare for the installation of an operating system (OS) by checking materials and equipment required eg
   - a hardware
   - b source disks
   - c installation instructions
   - d installation plan and fault reporting log
   - e back-up media
   - f passwords
   - g user permissions/details

2 perform a back-up of existing data

3 conduct a virus scan on the installation media

4 inspect system for suitability before installing an OS by checking eg
   - a compatibility of hardware
   - b minimum system requirements
   - c boot sequence

5 install OS software or upgrades according to instructions and installation plan

6 apply OS patches/upgrades/service packs

7 apply user specific settings to the system

8 install relevant device drivers eg
   - a scanner
   - b printer
   - c audio/video card
   - d modem/NIC

9 install anti-virus and firewall software according to given instructions

10 check that the system functions satisfactorily

11 maintain installation and software records

12 produce reports of any problems encountered during installation.

Underpinning knowledge

The candidate will be able to:

1 state the purpose of testing hardware and fixing failures before installing an OS

2 explain the following terms

- a system specification
- b minimum system requirements
- c recommended system requirements

3 state the reasons for backing-up user data and identify standard methods used

4 state the reasons for checking installation media eg disks/download site for viruses

5 identify additional information that will be required during installation eg

- a passwords
- b product identification numbers
- c serial numbers
- d user details

6 identify reasons for upgrading OS software eg

- a bug fixes
- b new version release
- c improved performance
- d ease of use

7 state the purpose of device drivers, and identify safe sources and procedures for obtaining them

8 identify common types of problems and their solutions that can occur during installation eg

- a insufficient memory
- b insufficient free space on hard drive
- c earlier version of software already loaded

9 describe the main software licensing features to be considered when installing OS software eg

- a freeware
- b shareware
- c single user
- d multi user
- e corporate licence

10 describe common procedures for software registration and documentation eg

- a on-line
- b telephone
- c email
- d postal registration card.

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Outcome 5 Configure and test an installed operating system

Practical activities

The candidate will be able to:

1 adjust OS software settings according to instructions, and document changes made eg
   - a default and other printers
   - b time/date
   - c screen resolution
   - d language settings
   - e network drives
   - f screen saver
   - g screen font size/colour

2 restore standard default settings of the OS

3 prepare test plans for an OS from a standard testing procedure

4 test an OS functionality following an installation

5 resolve any conflicts/errors that exist in an OS configuration

6 produce test/installation reports.

Underpinning knowledge

The candidate will be able to:

1 explain why individual users may need the OS software settings modified eg
   - a different display/screen settings
   - b default storage locations
   - c virtual memory settings
   - d date/time
   - e mouse/keyboard settings
   - f passwords
   - g sounds

2 explain reasons for restoring default settings to OS software

3 explain the purpose of testing OS software following installation

4 explain why software should be set up according to user and organisational requirements

5 describe factors that can cause OS software not to perform as expected eg
   - a conflicts with other software components
   - b accidental deletion or relocation of software files
   - c incompatibility with hardware

6 identify actions to be taken on completion of testing eg
   - a submitting test report
   - b reporting identified errors
   - c following maintenance procedures.

Unit record sheet

Use this form to track your progress through this unit.

Tick the boxes when you have covered each outcome. When they are all ticked, you are ready to be assessed.

Outcome	✓	Date
1 Prepare hardware/equipment for installation	☐	
2 Install and configure hardware/equipment	☐	
3 Test installed hardware/equipment	☐	
4 Prepare, carry out and document the installation and upgrade of an operating system	☐	
5 Configure and test an installed operating system	☐	

Candidate Signature ..... **Date** .....

City & Guilds Registration Number .....

Quality nominee (if sampled) ..... **Date** .....

Assessor Signature ..... **Date** .....

External Verifier Signature (if sampled) ..... **Date** .....

Centre Name ..... **Centre Number** .....

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