Systems and Principles Unit Syllabus

Level 2 ICT Systems monitoring and operation

7540-232

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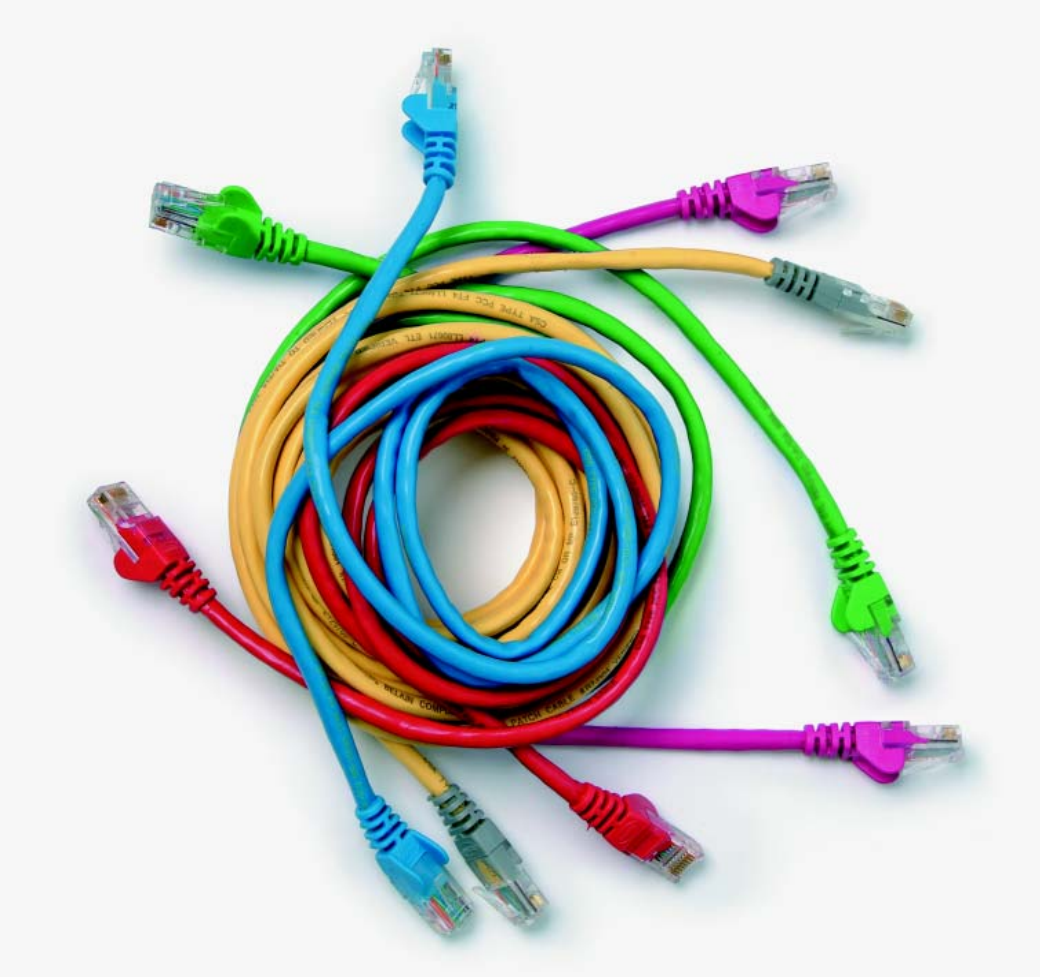
January 2011
Version 2.0



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Unit 232 ICT Systems monitoring and operation

Syllabus Overview

Rationale

This unit will enable the candidate to monitor and operate ICT systems. Candidates will get hands on experience to use tools to monitor the operation and performance of ICT systems. They will also learn to operate and maintain peripherals used within an ICT environment. Emphasis is given to back-up systems in order to save critical data.

Learning outcomes

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

- Monitor the operation of ICT systems
- Operate and maintain systems and peripherals
- Perform back-up and restoration of data

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.

Key Skills

This unit contributes towards the Key Skills in the following areas:

Application of number	N/A
Communication	2.1a.1, 2.1a.2, 2.1a.3, 2.1b.1, 2.1b.2, 2.1b.3
ICT	2.1.1, 2.2.1, 2.2.2, 2.3.1, 2.3.2
Working with others	2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2, 2.2.3, 2.3.1, 2.3.2, 2.3.3
Improving own learning	2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2, 2.2.3, 2.3.1, 2.3.2, 2.3.3
Problem solving	2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2, 2.2.3, 2.3.1, 2.3.2, 2.3.3

Assessment and grading

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

Unit 232 ICT Systems monitoring and operation

Outcome 1 Monitor the operation of ICT systems

Practical activities

The candidate will be able to:

1 use designated tools to monitor the operation and performance of ICT systems eg
   - a stand-alone systems
   - b networked systems
   - c performance and system monitors
   - d fault logging and tracing
   - e power monitors
   - f network/protocol analysers

2 carry out routine operator maintenance on ICT systems according to prescribed schedules eg
   - a cleaning
   - b diagnostics, self-tests and visual checks
   - c regular servicing of drives and printers

3 identify failures of ICT systems reported by system monitoring tools eg
   - a unacceptable speed
   - b unacceptable number of connection drop-outs
   - c difficulty in accessing data
   - d difficulty in running software

4 report on ICT systems loss of performance

Practical activities continued

5 maintain and update operational records eg
   a machine hardware
      i serial number
      ii location
      iii parts fitted
      iv configuration
   b machine software
      i operating system details
      ii software installed
      iii configuration
   c network details
      i IP address
      ii server name
      iii computer name
      iv details of workgroup
   d details of the users of the machine
   e access rights
   f security arrangements eg
      i firewalls
      ii anti-virus protection
   g fault log
   h maintenance log
   j upgrade log
   k performance log
   l back-up log
6 restart tasks within operational schedules.

Underpinning knowledge

The candidate will be able to:

1 differentiate between the main types of ICT systems used

2 identify the basic components and their functions used in an ICT system

3 state the main operational requirements of typical ICT systems
- a stand-alone systems
- b networked systems

4 identify tools available to monitor the operation and performance of ICT systems, and state their features

5 identify common symptoms of ICT systems failing to meet operational requirements eg
- a slow running system (user satisfaction)
- b inability to see other workstations
- c unable to log on
- d system crashing

6 describe the content of typical operational records eg
- a machine hardware
  - i serial number
  - ii location
  - iii parts fitted
  - iv configuration
- b machine software
  - i operating system details
  - ii software installed
  - iii configuration
- c network details
  - i IP
  - ii server name
  - iii computer name
  - iv details of workgroup
- d details of the users of the machine
- e access rights
- f security arrangements eg
  - i firewalls
  - ii anti-virus protection
- g fault log
- h maintenance log
- j upgrade log
- k performance log
- l back-up log

Underpinning knowledge continued

7 explain the main points of legislation relating to ICT system operation eg
   - a health and safety at work (basic risk assessment)
   - b data protection
   - c computer misuse
   - d environmental protection (safe disposal of waste)
   - e licensing legislation
   - f copyright, designs and patents

8 explain reasons for complying with manufacturers' instructions and organisational procedures when monitoring the performance of ICT systems

9 describe what is meant by
   - a service operations
   - b an event

10 use and apply information to escalate events

11 state the importance of working with regard to
   - a professional and ethical standards
   - b integrity and confidentiality

12 describe the potential implications to an organisation of work not being conducted in a timely and efficient manner

13 identify, use and apply escalation procedures with external providers

14 state what is meant by
   - a technical support
   - b a patch
   - c a release
   - d an infrastructure refresh programme

15 identify the costs of repairing and replacing faulty components and peripherals

16 state the importance of communicating effectively with external providers and customers

17 state the importance of documenting changes, repairs, replacements and known errors.

Unit 232 ICT Systems monitoring and operation

Outcome 2 Operate and maintain systems and peripherals

Practical activities

The candidate will be able to:

1 select, prepare, load and unload consumables/media for system peripherals (tape drive, disk drives, scanner, printer, etc) to meet operational requirements eg
   - a paper
   - b cartridges
   - c toner
   - d optical rewritable disks
   - e labels
   - f photo-quality materials
   - g other related consumables/media

2 configure system peripherals to meet operational requirements and to suit the consumables/media selected eg
   - a paper size
   - b tray select
   - c recording mode/density

3 rectify common operator-level problems in the operation of system peripherals eg
   - a out of paper
   - b empty cartridge
   - c recording media full

4 accurately report any problems which cannot be rectified by the operator

5 perform routine operator maintenance on ICT systems according to prescribed schedules eg
   - a cleaning
   - b diagnostics, self-tests and visual checks
   - c regular servicing of drives
     - i tape
     - ii CD/DVD
     - iii USB
   - d servicing of printers
     - i laser
     - ii inkjet

Practical activities continued

6 maintain and update operational and system maintenance records eg
   a installed hardware
   b installed software
   c routine maintenance
   d storage and update of system media and documentation
   e storage and issue of consumable materials
7 fix failures of ICT systems to meet operational requirements eg configure/upgrade
   a operating system
   b application software.

Underpinning knowledge

The candidate will be able to:

1 identify consumables/media to be used for operational requirements
   a consumables eg
      i paper
      ii toner
      iii ink jet cartridges
   b media eg
      i cartridges
      ii optical disks
2 identify common effects which can result from incorrect configuration of peripherals eg
   a incompatibility between users
   b address conflicts
3 state the correct methods of storing, handling and labelling of consumables/media storage
   a environment eg
      i temperature
      ii humidity
      iii exposure to magnetic fields
   b handling eg
      i paper right way up
      ii fanning paper before use
   c labelling eg write on label before attaching to disk

Underpinning knowledge continued

4 state the implications of incorrect storage, handling and labelling of consumables/media eg
   a loss of data
   b paper jams
   c poor printing
   d damage to equipment
5 identify common ways in which peripherals indicate low levels of consumables eg
   a audible warning
   b panel message
   c system message
6 identify common operator level problems in the operation of system peripherals, and state how these can be recognised
7 describe the content of typical operational records
8 explain the importance of routine operator maintenance
9 explain the importance of using the correct procedures and materials when cleaning ICT systems
10 state common problems in ICT systems which can be detected by visual/simple checks.

Unit 232 ICT Systems monitoring and operation

Outcome 3 Perform back-up and restoration of data

Practical activities

The candidate will be able to:

1 use system utilities to manage and protect computer file storage eg
   - a back-ups
   - b disk scan
   - c disk defragmentation
   - d virus check
   - e removal of other malicious software

2 select and use back-up media for use to meet prescribed schedules eg
   - a hard disk
   - b rewritable optical disks
   - c flash media

3 check and control system back-ups

4 perform system back-up operations eg
   - a manually copy system files
   - b use system utilities
   - c use third party software
   - d check/test back-up is successful

5 maintain prescribed back-up records

6 restore files from back-up media

7 control the physical storage of system media and documentation eg
   - a original software
   - b data archives
   - c system back-ups.

Underpinning knowledge

The candidate will be able to:

1 state the importance of backing up system software and data

2 state the importance of protecting system data from accidental or deliberate corruption

3 state the importance of 'good housekeeping' when dealing with system file storage

- a protection from accidental loss or corruption of data
- b protection from malicious loss or corruption of data

4 explain the purpose and use of system utilities to manage file storage

5 describe the facilities available for backing up systems eg

- a automated/scheduled back-up
- b manual back-up
- c full back-up
- d incremental back-up
- e differential back-up
- f online back-up, eg to a web server

6 identify commonly used back-up policies eg

- a type
- b frequency
- c retention period
- d tests for successful back-ups

7 identify the factors which determine the type and quantity of back-up media needed

- a size of data
- b type of back up

8 state the importance of maintaining back-up records and the correct labelling, handling and storage of back-up media

9 state the importance of restoring only specified files

10 describe commonly available hardware for backing up system software and data eg

- a rewritable drives (CD/DVD)
- b flash media
- c RAID arrays
- d mirror sites

11 describe factors to consider when selecting data storage eg

- a location (on/off site)
- b fire/bomb/intruder proof
- c number/type of media required
- d ease of access in the event of a disaster

Underpinning knowledge continued

12 explain the factors that need to be considered when selecting back-up procedures eg
   a how critical is the data
   b how often does it change and by how much
   c how quickly would recovery need to be completed
   d how much data will be backed up
   e who will be responsible
   f how many copies are required

13 state the importance of controlling user access to system resources.

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 Monitor the operation of ICT systems	☐	
2 Operate and maintain systems and peripherals	☐	
3 Perform back-up and restoration of data	☐	

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

City & Guilds Registration Number .....

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

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

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

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