Systems and Principles Unit Syllabus

Level 3 Install, configure and integrate networked hardware and software

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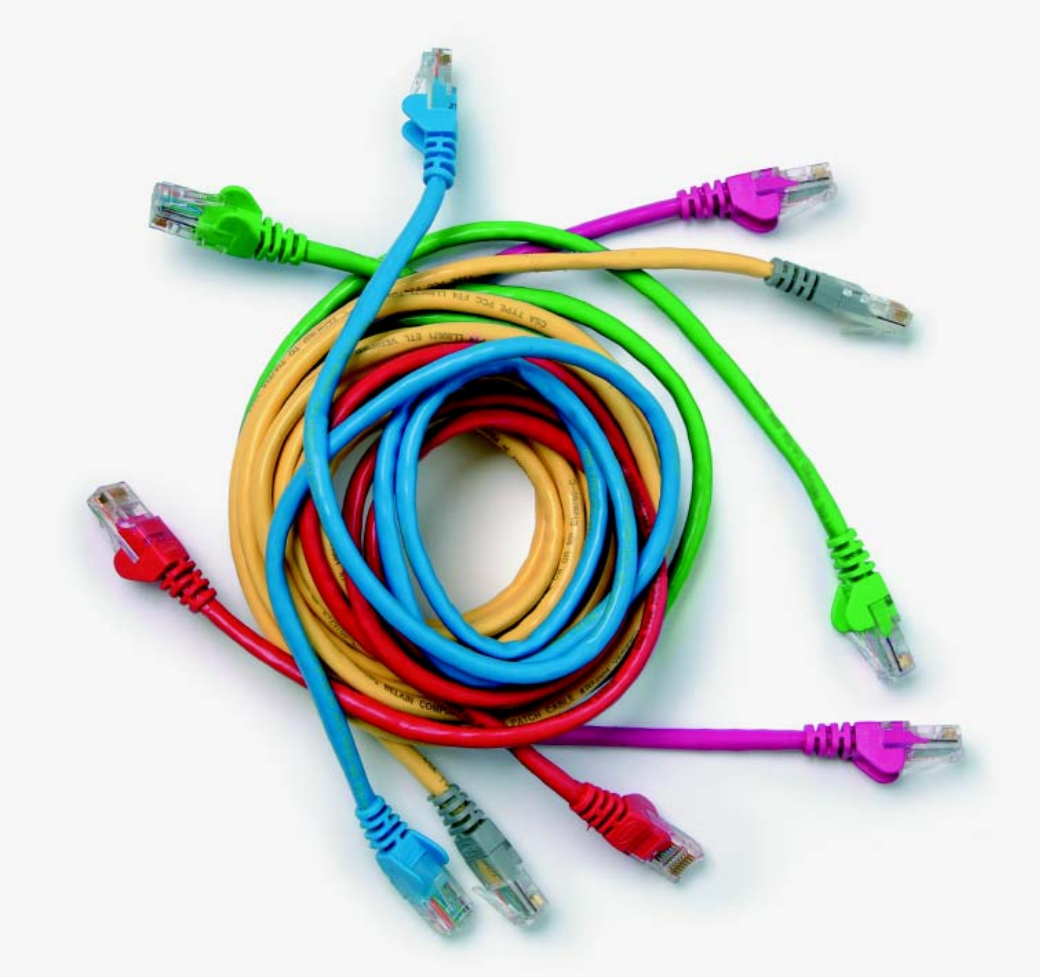

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Unit 361 Install, configure and integrate networked hardware and software

Syllabus Overview

Unit accreditation number **J/501/3996**

Credit value **9**

Rationale

This unit will enable the candidate to install, integrate and configure ICT components and networks.

Learning outcomes

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

- Carry out a risk assessment and ensure health and safety procedures are followed
- Survey the user environment for installation of hardware equipment and systems
- Install hardware equipment and systems
- Install and configure systems software
- Expand (by integration) ICT systems to allow additional facilities

Guided learning hours

It is recommended that **90** hours should be allocated for this unit. This may be on a full time or part time basis.

Connections with other qualifications

This unit contributes towards the knowledge and understanding required for the Level 3 Diploma in ICT Professional Competence

Assessment and grading

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

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Outcome 1 Carry out a risk assessment and ensure health and safety procedures are followed

Practical activities

The candidate will be able to:

1 carry out a risk assessment of the work area relating to ICT

2 maintain health and safety records and documentation

3 identify areas of the working environment that do not comply with statutory regulations

4 make recommendations for changes to procedures and policies in the working environment.

Underpinning knowledge

The candidate will be able to:

1 describe employers and employees duties as required by relevant health and safety legislation

2 explain the reasons for keeping health and safety records

3 describe effective methods for monitoring activities and understanding of others in health and safety

4 explain why it is important that people have up to date information about applicable health and safety procedures, and understand their responsibilities

5 describe effective methods of communicating health and safety procedures, eg

- a oral
- b written
- c electronic

6 describe how risks may result from a variety of hazards, eg

- a the use of hazardous substances
- b the use and maintenance of plant, equipment and materials
- c poor working practices
- d unsafe behaviour
- e accidental breakage and spillage
- f obstructions
- g poor personal health

7 describe how risks are categorised

8 explain the benefits of risk assessment

9 explain the reasons why working practices that contravene statutory regulations should be reported promptly and who they should be reported to

10 describe the importance of reporting 'near misses' and initiating corrective action.

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Outcome 2 Survey the user environment for installation of hardware equipment and systems

Practical activities

The candidate will be able to:

1 prepare a site survey checklist for the installation of hardware equipment/systems, eg
   - a identify factors which might affect installation
   - b identify potential problems

2 plan access to the user's environment

3 survey the user's environment for, eg
   - a positioning of network cabling (or need for wireless systems), hubs, routers
   - b location of stand-alone equipment
   - c location of client servers
   - d access to power supply
   - e environmental control

4 prepare and deliver a report on the survey

5 create an installation plan and schedule.

Underpinning knowledge

The candidate will be able to:

1 describe the reasons for surveying the user's environment prior to the installation of hardware equipment/systems, eg
   - a safety
   - b suitability
   - c minimise disruption

2 describe factors to be considered prior to installing hardware equipment and systems eg
   - a access constraints
     - i security
     - ii physical access
     - iii operational disruption
   - b environmental
     - i existing equipment
     - ii availability of utilities and services
     - iii ambient conditions

3 identify potential problems which might affect installation, eg
   - a health and safety issues
   - b accommodation
   - c availability of utilities and services
   - d access to building
   - e structure for cabling

4 identify possible reasons for not proceeding with installation, eg health and safety issues, availability of utilities and services

5 describe the main points that should be included in an installation plan covering
   - a hardware equipment
   - b system software
   - c configuration.

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Outcome 3 Install hardware equipment and systems

Practical activities

The candidate will be able to:

1 install and test hardware and systems, eg
   - a stand-alone
   - b peer-to-peer network
   - c wireless network
   - d client server
   - e network cabling, switches and routers
   - f network interface cards (NIC)
   - g workstation
   - h network printer

2 test the installed equipment, to confirm successful installation

3 identify, investigate and resolve any problems encountered

4 create and maintain installation records.

Underpinning knowledge

The candidate will be able to:

1 describe test procedures for different types of hardware equipment and systems, eg
   - a self test
   - b diagnostics
   - c manual tests

2 explain handling and transport procedures for hardware eg
   - a packaging
   - b antistatic precautions
   - c movement

3 describe types of network, eg
   - a peer-to-peer
   - b server based
   - c wireless

4 identify network topologies, eg
   - a ring
   - b star
   - c bus
   - d mesh

5 describe the purpose of network interface cards eg
   - a Ethernet
   - b wireless

6 identify suitable network media, eg
   - a twisted pair
   - b fibre optic
   - c wireless

7 describe the importance of keeping accurate installation records.

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Outcome 4 Install and configure systems software

Practical activities

The candidate will be able to:

1 check the integrity of the software to be installed, eg virus check, and the installation media (disk scan)

2 install the software

- a operating system/networked operating system
- b device drivers
- c applications, eg browser, word processing, database

3 set up and configure a network, eg

- a user accounts
- b shared folders/access
- c user rights
- d group rights/permissions
- e passwords

4 configure maintenance routines, eg

- a system monitor
- b system tune up
- c back-up routines
- d virus monitoring
- e firewalls
- f passwords
- g encryption
- h access policies

5 identify and investigate any problems encountered, resolve and record the details

6 maintain installation records.

Underpinning knowledge

The candidate will be able to:

1 describe the types of actions required to preserve the integrity of the existing system and data, eg
   - a backing up software and data
   - b on-line back-up of system and data
   - c logging out users

2 explain why it is important to check the integrity of installation media eg
   - a completeness
   - b free from corruption
   - c virus free

3 identify potential conflicts between the planned installation and user requirements, eg
   - a human
   - b physical
   - c technical
   - d software levels

4 describe what type of tests can be applied to confirm successful installation of system software, eg
   - a built in diagnostics run
   - b system loads successfully

5 explain what types of information should be recorded on installation records, eg
   - a name and version
   - b licence number
   - c contact/help numbers

6 describe the importance of keeping accurate installation records

7 describe security arrangements, eg
   - a confidentiality
   - b copyright
   - c data protection
   - d data loss and back-up
   - e virus checking
   - f firewalls
   - g physical barriers.

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Outcome 5 Expand (by integration) ICT systems to allow additional facilities

Practical activities

The candidate will be able to:

1 determine the expected functionality and performance of the expanded ICT system, eg additional
   - a workstation
   - b printer
   - c scanner

2 identify a suitable method for integrating the ICT system, eg
   - a connection to an existing connecting point
   - b creating additional connection points

3 check the additional components for compatibility with the existing system

4 determine suitable configuration options for the intended additional components, eg
   - a TCP/IP address
   - b access authorisation
   - c passwords
   - d designations

5 determine what actions are required to preserve the integrity of any existing system or data, eg
   - a back-up
   - b anti-virus check
   - c reconfiguration of firewall
   - d reorganise user groups

6 prepare a plan for the integration of the ICT system which covers, eg
   - a actions required to preserve the integrity of any existing system or data
   - b configuration of components
   - c installation of new components
   - d tests to ensure that the expected functionality and performance have been achieved

7 install additional components and configure the systems

8 test the system to confirm that it functions

9 demonstrate the integrated system and train users as necessary

10 comply with relevant legislation and regulations for hardware when integrating systems.

Underpinning knowledge

The candidate will be able to:

1 state circumstances when components might be added to an existing system, eg
   - a new users
   - b more capacity required
   - c more/different output devices required
   - d new functionality

2 state circumstances when components may be removed, eg
   - a obsolescence
   - b over capacity
   - c change of system requirements

3 identify causes of problems that can arise during expansion (integration) of ICT systems covering, eg
   - a hardware incompatibility, eg revision level
   - b software incompatibility, eg version level

4 describe the effects of problems that can arise during expansion (integration) of ICT systems
   - a reduction in system performance
   - b reduction in system function
   - c reduction in system capacity
   - d data loss or corruption

5 describe how ICT components can be configured to resolve problems covering
   - a physical configuration of hardware
   - b logical configuration of hardware
   - c configuration of software associated with hardware (eg drivers)
   - d configuration of system software
   - e configuration of application software

6 describe how to assess the function and performance required of the expanded (integrated) system

7 describe how to assess the additional components for compatibility with existing systems

8 describe the types of action required to preserve the integrity of the existing system and data, eg
   - a backing up software and data
   - b logging out users

9 describe typical format and content of an expansion (integration) plan, eg

- a performance of existing systems
- b expected performance after expansion (integration)
- c actions to preserve the integrity of existing data and software
- d method of installation of new components (connection, configuration)
- e revised system configuration
- f testing method and expected results
- g user training requirements

10 describe reasons for complying with professional and ethical standards, legislation and regulations when integrating systems.

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	**Carry out a risk assessment and ensure health and safety procedures are followed**	☐	
2	**Survey the user environment for installation of hardware equipment and systems**	☐	
3	**Install hardware equipment and systems**	☐	
4	**Install and configure systems software**	☐	
5	**Expand (by integration) ICT systems to allow additional facilities**	☐	

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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