

Unit Syllabus

Level 2 Digital Home Technology Integrator

7575 - 002



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Rationale

This unit will enable candidates to plan and install integrated digital technologies in a home environment. Candidates will develop an understanding of the technologies available and how they can be integrated in a home environment to meet customer's needs. They will also develop practical skills required to install these components and manage them.

Level: 2**Unit no: L/502/4045****Credit value: 9****GLH: 60****Learning Outcomes**

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

1. Plan and document an integrated system that to meet a customer's needs.
2. Install and configure a wired or wireless networks in a home environment
3. Secure data on a home network
4. Configure the hardware and software required for VoIP
5. Install and configure a wired or wireless security devices in a home environment
6. Install and configure a wired or wireless control system
7. Install and configure the hardware and software required for sharing AV content over a network
8. Install and configure audio components
9. Install and configure a home theatre system
10. Troubleshoot integrated systems

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Outcome 1

Plan and document a local area network to meet a customer's needs

Practical activities

The candidate will be able to:

- 1 determine the customer's requirements
 - a. types of activities that are going to be undertaken by the customer
 - b. proposed locations of any new media and devices
 - c. the location of existing devices that need to be integrated in to the network
 - d. types and location of any existing media and sockets
 - e. any architectural features that may affect the choice of media being used
- 2 produce plans and document a solution to meet the customer's requirements using written or electronic methods that detail:
 - a. the location of each device
 - b. the location of the media
 - c. the type of media used
 - d. the technical specifications of the devices used
 - e. distances between devices/length of each segment of media
 - f. location of data, phone and power sockets
 - g. IP addresses and subnet masks to be used by each device
 - h. Software and device drivers required
- 3 obtain information from a range of sources
 - a. written manuals eg manufacturers documentation
 - b. on-line resources eg manufactures websites

Underpinning knowledge

The candidate will be able to:

- 1 identify suitable types of media to meet the customer's requirements such as
 - a. Cat 5 UTP
 - b. PowerLine devices
 - c. Wireless
2. State the characteristics of the media that has been selected
 - a. Speed
 - b. Maximum permitted length of cable
 - c. Causes of interference on wired networks
 - d. Devices that could cause interference with transmission of data on wireless networks
 - e. IEEE 802.11 standards

Underpinning knowledge continued.....

- 3 identify types of devices that are suitable for a home network
 - a. Wireless router
 - b. Wireless access points
 - c. Hubs
 - d. Switches
 - e. Modems
 - f. VoIP devices

4. identify types of software required to meet the customer's needs
 - a. Operating System
 - b. Device drivers
 - c. VoIP software eg Skype
 - d. Firewall
 - e. Anti virus

- 5 describe the importance of networking protocols
 - a. IP V4 addresses
 - b. IP V4 Classes and default subnet masks
 - c. IP V6 addresses
 - d. DNS
 - e. DHCP

6. Identify sources of technical information
 - a. Manufacturers handbooks
 - b. Manufacturers websites

- 7 explain the reasons behind producing plans and documentation for a solution
 - a. Aids fault finding once the network is established
 - b. Allows the customer to confirm that they are happy with the selected equipment and layout
 - c. Information regarding the configuration of software and protocols is available to the customer if they wish to add devices once the network has been commissioned.

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Outcome 2

Install and configure a wired or wireless network in a home environment

Practical activities

The candidate will be able to:

- 1 Install wired media and devices
 - a. Termination of cables
 - b. Installing cables
 - c. Site devices appropriately
- 2 Configure devices used with wired and wireless networks
 - a. Configure devices
 - b. Test devices to ensure that they are functioning correctly
 - c. Enable Resource sharing and Peer-to-Peer networking
 - d. Test connectivity

Underpinning knowledge

The candidate will be able to:

- 1 Identify the characteristics of media
 - a. Types of media available
 - b. Methods of terminating cables
 - c. Cable standards
 - d. Wireless network standards
 - e. Health and Safety requirements
 - f. Data transmission speeds
2. explain how to install and configure devices
 - a. IP Addresses
 - b. Subnet masks
 - c. SSID
 - d. WEP/WPA
 - e. Firewalls
 - f. Network devices such as Hubs, switches and routers
 - g. Peer-to-Peer networking
 - h. Remote access
 - i. Files sharing
 - j. Broadband technologies such as ADSL and Cable
 - k. Causes of interference on wireless networks
 - l. DHCP
 - m. DNS

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Outcome 3

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Securing data on a home network

Practical activities

The candidate will be able to:

- 1 Install and configure an anti virus package
 - a. Installing an anti virus package
 - b. Configuring the anti virus package
 - c. Updating the virus definition
- 2 Install and configure firewalls
 - a. Install hardware and software firewalls
 - b. Configure software firewalls on individuals PCs
 - c. Configure devices such as wireless routers that have firewall capabilities
 - d. Update firewall definitions
3. Configure security and privacy settings for a web browser eg
 - a. Cookies
 - b. Restricted sites
 - c. Content adviser
 - d. Managing browser add-ons

Underpinning knowledge

The candidate will be able to

- 1 explain aspects of home networking security
 - a. Types of Virus
 - b. Antivirus software
 - c. Firewalls
 - d. Securing web browsers
 - e. Cookies
 - f. Spy ware
 - g. Malware
 - h. Physical security of IT equipment
- 2 explain aspects of wireless network security
 - a. WEP
 - b. WPA/WPA 2
 - c. SSID
 - d. MAC Filtering

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Outcome 4

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Configure the hardware and software required for VoIP.

Practical activities

The candidate will be able to:

- 1 Install and configure software and hardware required to allow VoIP communications.
 - a. Install hardware devices eg DSL Splitter, VoIP handset or cable modem
 - b. Install associated software eg device drivers, application software such as Skype
 - c. Configure the associated software

Underpinning knowledge

The candidate will be able to:

- 1 Identify VoIP/telephony technologies
 - a. PTSN
 - b. Broadband technologies
 - c. Types of media associated with broadband technologies
 - d. VoIP hardware devices
 - e. VoIP software
- 2 Explain how to install and configure VoIP hardware and software
 - a. How to configure VoIP devices
 - b. How to configure VoIP software

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Outcome 5

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Install and configure a wired or wireless security devices in a home environment

Practical activities

The candidate will be able to:

- 1 install wired/wireless devices
 - a. Installing cables
 - b. Site devices appropriately
 - c. Install surge suppression and power conditioning devices
 - d. Install security systems eg cameras
- 2 configure installed devices
 - a. Configure devices
 - b. Test devices to ensure that they are functioning correctly

Underpinning knowledge

The candidate will be able to:

- 1 explain how to install media
 - a. Types of cables available
 - b. Methods of terminating cables
 - c. Cable standards
 - d. Wireless protocols
 - e. Health and Safety requirements
2. explain how to Install and configure devices
 - a. IP Addresses
 - b. Subnet masks
 - c. How to configure device ID if required
 - d. Identify methods that can be used to protection the home from variations the supply of electricity eg Surge Suppression, Power Conditioning
 - e. Security and control zones
 - f. Types of media used to connect devices
 - g. Types of sensors
 - h. Types of cameras used with security systems
 - i. Methods of recording the output from security cameras

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Outcome 6

Level 2 Digital home technology integrator

Install and configure a wired or wireless control system

Practical activities

The candidate will be able to:

- 1 Install wired/wireless devices
 - a. Install cables
 - b. Site devices appropriately
 - c. Install a control systems
- 2 Configure installed devices
 - a. Configure devices
 - b. Install any software that is required eg device drivers, applications
 - c. Test devices to ensure that they are functioning correctly

Underpinning knowledge

The candidate will be able to:

- 1 explain how to install media
 - a. Types of cables available
 - b. Methods of terminating cables
 - c. Cable standards
 - d. Wireless protocols
 - e. Health and Safety requirements
2. explain how to install and configure devices
 - a. Protocols and standards associated with control systems eg X10, Zigbee
 - b. How to configure device ID if required
 - c. Security and control zones
 - d. Types of media used to connect devices
 - e. Types of control devices
 - f. Types of sensors
 - g. Types of control software available
 - h. Install environmental control devices

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Outcome 7

Level 2 Digital home technology integrator

Install and configure the hardware and software required for sharing AV content over a network.

Practical activities

The candidate will be able to:

- 1 Install and configure hardware and software required to share AV content over a network.
 - a. Install hardware devices eg TV card, Content management servers
 - b. Install associated software eg device drivers, application software such as Real player
 - c. Configure the associated software
 - d. Test the components to ensure that they are functioning correctly

Underpinning knowledge

The candidate will be able to:

- 1 identify AV networking technologies
 - a. TV Cards
 - b. Content management servers
 - c. Types of termination eg HDMI, DVI, RJ45
 - d. Media extenders
 - e. External storage devices
 - f. Media Centres
 - g. tuner types e.g. NTSC, PAL, ATSC, QAM,
 - h. Media used in AV systems eg RG-59, RG-6
- 2 Explain how to install and configure AV hardware and software
 - a. How to configure AV devices associated with sharing content.
 - b. Installing associated device drivers and application software
 - c. Digital Right Management
 - d. Digital Distribution eg Analog to IP converters, IP to Analog converters

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Outcome 8

Level 2 Digital home technology integrator

Install and configure audio components

Practical activities

The candidate will be able to:

- 1 Install an audio system
 - a. Install components eg amplifier, speakers
 - b. Test the system to ensure that it functions correctly

Underpinning knowledge

The candidate will be able to:

- a. explain how to install an audio system
- b. cable use - Line level versus speaker level
- c. Ohm's Law e.g. Impedance matched or non-impedance matched
- d. Local amplification, Centralised amplification
- e. Speaker types eg In wall, Surface mounted, Ceiling mounted, Freestanding
- f. Speaker specifications eg Frequency response, Efficiency, Power handling
- g. Control devices eg Keypads, Rotary volume controls, Sliders
- h. Codecs eg MP4
- i. Integrating MP3 and iPods in to an AV system

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Outcome 9

Level 2 Digital home technology integrator
Install and configure a home theatre system

Practical activities

The candidate will be able to:

- a. Install, configure and maintain a home theatre system
- b. Install components eg digital projector, speakers
- c. Test the system to ensure that it functions correctly

Underpinning knowledge

The candidate will be able to:

- a. explain how to install the video components of a home theatre:
- b. Display types e.g. Plasma, LCD, CRT, Rear projection, Front projection
- c. Hi Definition resolutions options e.g. 720p, 1080i, 1080p,
- d. Aspect Ratios
- e. Video Calibration eg colour balance, contrast, brightness
- f. Digital video cable and connector types eg DVI and HDMI
- g. Digital video cables compatibility and interoperability issues
- h. Composite, Component, and S-Video signals

Practical activities

The candidate will be able to:

- 1 Troubleshoot media, software and devices
 - a. Visually inspect cables and connections
 - b. Use cable tester
 - c. Check network configurations
 - d. Use utilities such as Ping, ipconfig, tracert
 - e. Check manufacturers websites for software updates
 - f. Identify causes of interference when using wireless devices
 - g. using cable testers
 - h. Locate causes of false alarms in security systems
 - i. How to update software

Underpinning knowledge

The candidate will be able to:

- 1 Explain the troubleshooting process
 - a. Cross talk
 - b. Causes of interference when using wireless networks
 - c. How to update software
 - d. IP addresses and subnet masks
 - e. DHCP
 - f. DNS
 - g. Default gateways
 - h. Types of cable testers
 - i. How to use cable testers
 - j. Wired media termination

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. Plan and document a local area network to meet a customer's needs.	<input type="checkbox"/>	
2. Install and configure a wired or wireless networks in a home environment	<input type="checkbox"/>	
3. Securing data on a home network	<input type="checkbox"/>	
4. Configure the hardware and software required for VoIP	<input type="checkbox"/>	
5. Troubleshooting networks	<input type="checkbox"/>	

Candidate Signature Date

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Registration Number

Quality nominee
(if sampled) Date

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