Systems and Principles Unit Syllabus

Level 3 Networking Principles
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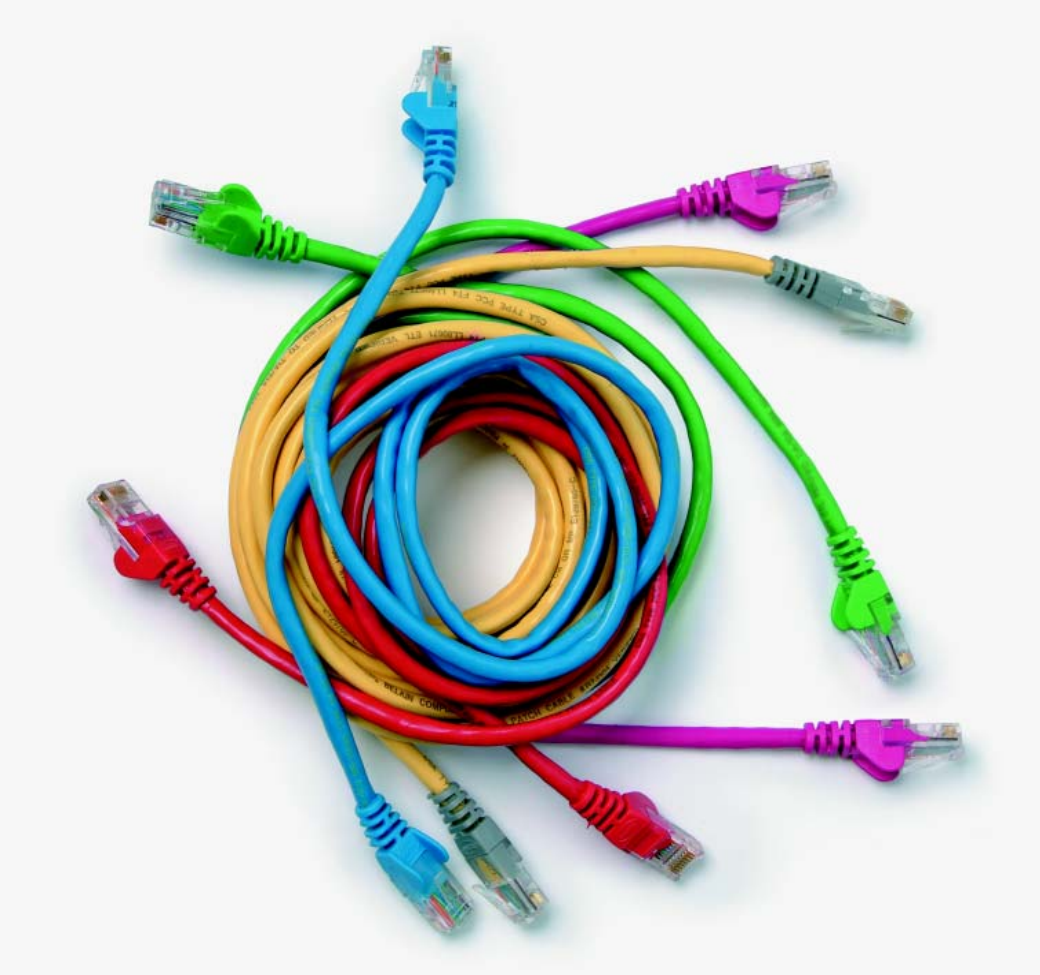

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Syllabus Overview

Unit accreditation number **J/601/3250**

Credit value **10**

Rationale

This unit is aimed at advanced Networking students who already posses the fundamentals of computer networks and desktop PC support and are now moving to study second and third line support roles where network operations and troubleshooting are now more fundamental to the job role. This qualification should be studied alongside a logical network design and server admin and server application infrastructure qualification.

In addition a more fundamental network security qualification should also be studied.

Learning outcomes

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

- Understand physical and logical Topologies and Systems
- Understand the Open Systems Interconnection (OSI) model
- Understand the Internet Protocol Suite (TCP/IP)
- Implement a network

Guided learning hours

It is recommended that 75 guided learning 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 learning outcomes and assessment criteria 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 underpinning knowledge.

Unit 031 Networking Principles

Outcome 1 Understand physical and logical Topologies and Systems

Underpinning knowledge
The candidate will be able to:

1 Describe common physical network topologies, eg

- a Star
- b Ring
- c Bus
- d Mesh

2 Explain the difference between logical and physical network topologies

3 Describe the network topologies and hardware and software components used to implement common data communication systems, eg

- a Fast Ethernet
- b Token Ring
- c FDDI
- d NIC
- e UTP
- f MAC
- g CSMA/CD

4 Identify and briefly explain common

- a cable types and properties including: Ethernet, coaxial, fibre
- b connector types including: Rj45, BNC, Fibre
- c wiring standards including T565A / T565B
- d wireless standards including 802.11a/b/g/n

Unit 031 Networking Principles
Outcome 2 Implement a network

Underpinning knowledge
The candidate will be able to:

1 Describe the OSI model and how its layers relate to each other eg
   a Data flow

2 Explain the function of each layer of the OSI model

3 Describe the key features, protocols and standards of each OSI layer

Unit 031 Networking Principles

Outcome 3 Understand the Internet Protocol Suite (TCP/IP)

Underpinning knowledge

The candidate will be able to:

1 Describe the Internet Protocol Suite (TCP/IP) Four Layer model and the function of each layer eg

- a Application
- b Transport
- c Internet / Network
- d Network Access

2 Describe the key features, protocols and standards of each TCP/IP layer

3 Explain how each TCP/IP layer relates to the comparable OSI model layer, giving examples of

- a Functions
- b Protocols used

Unit 031 Networking Principles
Outcome 4 Implement a network

Practical activities
The candidate will be able to:

1 Design a routed network incorporating the following:
- a Internet protocol (IP) addressing
- b Simple Domain Name System (DNS) infrastructure
- c Dynamic Host Configuration Protocol (DHCP)
- d Category 5e / 6 (CAT5 / CAT6) cable using EIA/TIA 568 standards
- e Wireless 802.11 LAN

2 Plan, construct and configure the network. The plan should include:
- a all network nodes, clearly identifying subnetworks as appropriate
- b all networking hardware, type and location;
- c all network cabling;
- d the full IP addressing scheme for all network nodes
- e the proposed DNS structure
- f wireless protocols and encryption standards

The configuration should show:
- a DHCP settings along with any static addresses
- b Wireless settings
- c Login restrictions and password complexity

3 Test and record functionality eg
- a Ping
- b Traceroute

4 Evaluate the network and suggest improvements

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 Understand physical and logical Topologies and Systems	☐	
2 Understand the Open Systems Interconnection (OSI) model	☐	
3 Understand the Internet Protocol Suite (TCP/IP)	☐	
4 Implement a network	☐	

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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