

Open Awards Qualification Unit



This unit forms part of a regulated qualification.

1 Unit Details

Unit Title:	<input type="text" value="Optical Network Design and Planning"/>
Unit Reference Number:	<input type="text" value="T/618/8304"/>
Level:	<input type="text" value="3"/>
Credit Value:	<input type="text" value="5"/>
Minimum GLH:	<input type="text" value="30"/>

2 Learning Outcomes and Criteria

Learning Outcome (The Learner will):	Assessment Criterion (The Learner can):
1. Understand light propagation through optical fibres	1.1 Explain the structure of optical fibres
	1.2 Explain how light travels along fibres
	1.3 Describe the physics behind the wavelength windows used for fibre optic transmission
	1.4 Explain why dB units are used in fibre optics
	1.5 Describe the origins of the dBm unit
	1.6 Describe the principles of WDM, DWDM and CWDM multiplexing in optical networks
2. Understand the principles and use of fibre types and optical components	2.1 Identify the international specifications for fibre types and their potential usage
	2.2 Explain the difference between passive and active optical components
	2.3 Explain the function of splitters, couplers and WDMs
	2.4 Analyse a loss and power budget for a fibre link
3. Understand the principles, advantages and limitations of the different types of fibre duct, subduct, fibre tubes, bundles and cables	3.1 List common sizes and specifications of duct, subduct and microduct
	3.2 List common sizes, specification and construction of fibre cables
	3.3 Explain the priorities and requirements for different types of network such as backbone,

	metro and FTTX
	3.4 Critically compare the options for duct and fibre cabling for different types of network installation
4. Know how to plan a route and select the appropriate equipment	4.1 Identify legislation relating to network planning and cabling
	4.2 Identify the implications of potential route planning hazards
	4.3 Plan suitable routes for fibre links
	4.4 Choose appropriate duct, cable and installation method for each section of planned routes
	4.5 Plan appropriate locations for building entries, access chambers, and specify appropriate gas and water sealing
5. Understand the design requirements for Access Networks	5.1 Critically compare the different network architectures and topologies
	5.2 Give examples of types and layouts of access networks
	5.3 Explain the wavelengths, channels and components used in a typical PON access network
6. Understand the requirement for route documentation and commission testing	6.1 Explain the principles of line diagrams, as-built diagrams, route, maps and labelling schemes
	6.2 Plot an installed route
	6.3 Complete standard line diagrams, as-built diagrams and route maps as appropriate for planned routes
7. Understand design implications on network maintenance and emergency repair issues	7.1 Explain the concept of network resilience and the importance of minimising downtime
	7.2 Give examples of how diverse routing can be incorporated in network design to improve resilience

Required Equipment List
Exercises and case studies based on real networks Relevant BS EN/IEC standards