






Certificate in Networking (107) – Networking Essentials

<p>Prerequisites: Basic knowledge in the use of Microsoft Windows Applications.</p>	<p>Corequisites: A pass or higher in Diploma in Information Technology or equivalence</p>
<p>Aim: Candidates will learn to make 10 base T networking cables, structured wire installations, build and troubleshoot simple LAN's. Other topics include the OSI Model, data link and network layer devices, IP addresses, subnet masking, ARP and RARP. At the end of the course, students will be able to identify the components of a LAN and determine the type of network design most appropriate for a given site; identify the different media used in network communications, distinguish between them, and determine how to use them to connect servers and workstations in a network; differentiate between the different networking standards, protocols, and access methods and determine which would be most appropriate for a given LAN; recognise the primary network architectures, identify their major characteristics, and determine which would be most appropriate for a proposed LAN; identify the primary functions of network operating systems and distinguish between a centralised computing environment and a client/server environment; determine how to implement and support the major networking components (including the server, operating system, and clients), and propose a system for adequately securing data on a given LAN and protecting the system components; distinguish between LANs and wide area networks (WANs), identify the components used to expand a LAN into a WAN, and determine how to implement an appropriate modem in the larger LAN/WAN environment; identify strategic LAN support tools and resources, and determine how to use these in troubleshooting basic network problems; develop a plan for implementing a LAN that incorporates the concepts and components presented and identify the components of the Internet.</p>	
<p>Required Materials: Recommended Learning Resources.</p>	<p>Supplementary Materials: Lecture notes and tutor extra reading recommendations.</p>
<p>Special Requirements: The course requires a combination of lectures, demonstrations, discussions, and hands-on labs.</p>	
<p>Intended Learning Outcomes:</p> <p>1 Define a network and its advantages relative to standalone. Describe LAN, WAN, topology and file and print services.</p> <p>2 Identify organisations that set standards for networking and explain the layers of OSI Model.</p> <p>3 Identify characteristics of TCP/IP, NetBIOS, and AppleTalk and understand position of network protocols in OSI Model.</p> <p>4 Explain data transmission concepts including full-duplexing, attenuation, and noise.</p>	<p>Assessment Criteria:</p> <p>1.1 List the advantages of networked computing relative to standalone computing</p> <p>1.2 Identify elements of a network</p> <p>1.3 Describe several specific uses of a network</p> <p>1.4 Distinguish between client/server and peer-to-peer networks</p> <p>2.1 Describe specific networking services within each layer of OSI Model</p> <p>2.2 Explain how two systems communicate through OSI Model</p> <p>2.3 Discuss the structure and purpose of data frames</p> <p>2.4 Describe the two types of addressing contained in OSI Model.</p> <p>3.1 Identify the TCP/IP protocol suite and its functions</p> <p>3.2 Understand each protocol's addressing scheme</p> <p>3.3 Install protocols on Windows clients.</p> <p>4.1 Describe the physical characteristics of coaxial cable, STP, UTP, and fiber-optic</p>

<p>5 Describe the basic and hybrid LAN physical topologies, their uses, advantages, and disadvantages.</p>	<p>media</p> <p>4.2 Explain the benefits and limitations of different networking media</p> <p>4.3 Identify the best practices for cabling buildings and work areas</p> <p>4.4 Describe the methods of transmitting data through the atmosphere.</p> <p>5.1 Describe a variety of enterprise-wide and WAN physical topologies, their uses, advantages, and disadvantages</p> <p>5.2 Compare the different types of switching used in data transmission</p> <p>5.3 Describe transmission methods and logical topologies.</p>
<p>6 Identify functions of LAN connectivity hardware and isolate problems associated with connectivity hardware.</p>	<p>6.1 Install and configure a network adapter (network interface card)</p> <p>6.2 Describe the factors involved in choosing a network adapter, hub, switch, or router</p> <p>6.3 Describe the functions of repeaters, hubs, bridges, switches, and gateways</p> <p>6.4 Describe the uses and types of routing protocols.</p>
<p>7 Identify network applications that require WAN technology. Describe a variety of WAN transmission and connection methods.</p>	<p>7.1 Identify the criteria for selecting an appropriate WAN topology, transmission method, and operating system</p> <p>7.2 understand the hardware and software requirements for connecting to a network via modem</p> <p>7.3 Install and configure simple remote connectivity for a telecommunicating client.</p>
<p>8 Discuss the functions and features of a networking operating system.</p>	<p>8.1 Define the requirements for a Windows network environment</p> <p>8.2 Describe how a Windows server fits into an enterprise-wide network</p> <p>8.3 Perform a simple Windows Server installation</p> <p>8.4 Manage simple user, group, and rights parameters in Windows Server</p> <p>8.5 Understand how Windows Server integrates with other popular network operating systems.</p>
<p>9 Describe Ethernet</p>	<p>9.1 Define Ethernet</p> <p>9.2 Describe how Ethernet works</p>
<p>10 Discuss additional details of TCP/IP addressing and subprotocols. Comprehend the purpose and procedure for subnetting</p>	<p>10.1 Understand the history and uses of BOOTP, DHCP, WINS, DNS, and host files</p> <p>10.2 Employ multiple TCP/IP utilities for network troubleshooting</p> <p>10.3 Understand TCP/IP applications, such as Internet browsers, e-mail, and voice over IP</p>
<p>11 Describe the elements of an effective troubleshooting methodology</p>	<p>11.1 Follow a systematic troubleshooting process to solve networking problems</p>

<p>12 Perform a baseline analysis to determine the state of a network. Describe the steps involved in upgrading network operating system software</p> <p>13 Identify the characteristics of a network that keep data safe from loss or damage. Protect an enterprise-wide network from viruses</p> <p>14 Identify security risks in LANs and WANs. Explain how physical security contributes to network security</p>	11.2	Use a variety software and hardware tools to diagnose problems
	11.3	Discuss practical issues related to troubleshooting.
	12.1	Plan and follow regular hardware and software maintenance routines
	12.2	Describe the steps involved in adding or upgrading the network hardware
	12.3	Address the potential pitfalls of making changes to the network
	12.4	Research networking trends to plan future networking upgrades
	13.1	Explain network and system-level fault-tolerance techniques
	13.2	Discuss issues related to network backup and recovery strategies
	13.3	Describe the components of a useful disaster recovery plan
	14.1	Discuss hardware and design-based security techniques
	14.2	Use network operating system techniques to provide basic security
	14.3	Implement enhanced security through specialised software
14.4	Describe the elements of an effective security policy	

Recommended Learning Resources: Networking Essentials

Text Books	<ul style="list-style-type: none"> • Networking Essentials by Dave Kinnaman. ISBN-10: 0070676852 • Computer Networking Essentials by Debra Littlejohn Shinder. ISBN-10: 1587130386 • Networking Essentials Rapid Review Guide by A. Pastore. ISBN-10: 1882419901
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	None