LONDON CAPITAL COMPUTER COLLEGE

Diploma in Routing (111) – Internetwork Infrastructure

Prerequisites: Knowledge in Windows operating system.	**Corequisites:** A pass or higher in Certificate in Networking or equivalence.
Aim: How does the Internet work? The Internet's growth has become explosive and it seems impossible to escape the bombardment of www.com's seen constantly on television, heard on radio, and seen in magazines. Because the Internet has become such a large part of our lives, a good understanding is needed to use this new tool most effectively. This course explains the underlying infrastructure and technologies that make the Internet work. The course covers: Internet Addresses; Protocol Stacks and Packets; Networking Infrastructure; Internet Infrastructure; The Internet Routing Hierarchy; Domain Names and Address Resolution; Internet Protocols; Application Protocols: HTTP and the World Wide Web; Application Protocols: SMTP and Electronic Mail; Transmission Control Protocol. The course will enable candidates to understand internetworking requirements, identify solutions, and design the network infrastructure and services to ensure the basic functionality of the proposed solutions. The course provide candidates with the knowledge and skills required to achieve associate level competency in network infrastructure design. The elements for this competency are: Plan and design internet infrastructure to meet business requirements; Install and configure internet infrastructure to meet business requirements; Install and configure internet services to meet business requirements; Test security and internet access; Ensure that user accounts are verified for security access and monitored; Manage and support the internet.	
Required Materials: Recommended Learning Resources.	**Supplementary Materials:** Lecture notes and tutor extra reading recommendations.
Special Requirements: The course requires a combination of lectures, demonstrations and class discussions.	
Intended Learning Outcomes: 1. Describe internetworking devices and demonstrate the devices used in connecting individual networks to each other.	**Assessment Criteria:** 1.1 Explore how different network technologies work together 1.2 Discuss internetworking challenges 1.3 Analyse how OSI layers communicates 1.4 Explore different data formats 1.5 Compare and contrast connection orientated vs connectionless network services 1.6 Analyse information flow control and error-checking schemes 1.7 Outline internetworking standards organisations 1.8 Explore LAN protocols and LAN transmission methods 1.9 Analyse WAN protocols and technologies 1.10 Explore bridging and switching terminology 1.11 Outline routing protocol components 1.12 Analyse network management architecture 1.13 Outline open system interconnection protocols
2. Describe how LAN technologies are	2.1 Define Ethernet technology

designed for sharing resources and the classification category according to topology.	2.2 Discuss fiber and twisted-pair cables data rates 2.3 Describe token ring technology
3. Describe the various protocols and technologies used in wide- area network (WAN) environments and the relationship between the common WAN technologies and the OSI model.	3.1 Outline Frame-Relay WAN protocol 3.2 Explore High-Speed Serial Interface (HSSI) characteristics 3.3 Outline Integrated Services Digital Network (ISDN) underlying services and technologies 3.4 Outline Point-to-Point Protocol (PPP) components 3.5 Explore the Switched Multi-megabit Data Service (SMDS) technology 3.6 Describe the Synchronous Data Link Control (SDLC) protocol 3.7 Explore X.25 protocol 3.8 Describe Digital Subscriber Line (DSL) technology
4. Describe how network protocol controls data travels over an IP-based network in the form of packets and the addressing schemes used	4.1 Explore the history of internet protocols 4.2 Discuss IP addressing 4.3 Outline Address Resolution Protocol (ARP) 4.4 Explore IP Application-layer protocols 4.5 Describe IP multicast addresses
5. Demonstrate how bridges and switches data communications devices that operate principally at Layer 2 of the OSI reference model.	5.1 Describe transparent bridge operations 5.2 Explore source-route bridging algorithm 5.3 Outline Asynchronous Transfer Mode (ATM) devices and technology 5.4 Explore LAN switching technology 5.5 Describe Multiprotocol Label Switching (MPLS) operations 5.6 Outline IBM's Data Link switching 5.7 Analyse tag switching architecture
6. Demonstrate how routing technologies manage the flow of data between network segments, which are also known as subnets.	6.1 Discuss Fiber Distributed Data Interface (FDDI) specifications and operations 6.2 Outline Open System Interconnection Routing Protocols 6.3 Describe Open Shortest Path First (OSPF) protocol components 6.4 Explore Routing Information Protocol (RIP) features and capabilities 6.5 Outline Border Gateway Protocol (BGP) operations 6.6 Analyse Cisco's proprietary Interior Gateway Routing Protocol (IGRP) and Enhanced Interior Gateway Routing Protocol (EIGRP) design features and characteristics
7. Describe the many technologies and tools available for various functions of network management ensures reliable, high-quality application performance and delivery.	7.1 Explore Virtual Private Networks (VPN) technology 7.2 Outline remote monitoring specifications 7.3 Describe Simple Network Management Protocol (SNMP) operations

8. Describe the importance of Voice and data integration for the enterprise networks and ISPs.	8.1 Describe voice/data inter-operability standards 8.2 Describe Voice over IP (VOIP) technology 8.3 Define Media Gateway Control Protocol (MGCP)
9. Demonstrate examples of wireless technology and describe the differences between wireless technology and wired technology.	9.1 Outline the different types of wireless technologies 9.2 Discuss the advantages and disadvantages of wireless 9.3 Analyse IP wireless open standards 9.4 Compare and contrast WLAN standards
10. Describe the key technologies used in community Antenna Television (CATV) systems.	10.1 Describe CATV network 10.2 Explore downstream and upstream cable specifications 10.3 Discuss DOCSIS specifications
11. Explains the technologies used in dialup networks and discuss the benefits (and drawbacks) of different dialup technologies.	11.1 Describe dialup connectivity technology 11.2 Analyse networks dial-up methods 11.3 Describe advantages and disadvantages of dialup technology
12. Demonstrate how security technologies provides penetration testing software solutions that expose vulnerabilities, measure operational risk and assure security and describe hardware, software, networking, wireless computing, security and cutting-edge technologies.	12.1 Discuss internet security issues 12.2 Outline attack methods used to compromise network integrity 12.3 Explore trusted, untrusted and unknown networks 12.4 Outline considerations in establishing security perimeter
13. Describe how Quality of Service (QoS) technologies support levels of predictable performance for network systems and the elements of Quality of Service.	13.1 Describe QoS 13.2 Outline congestion management tools 13.3 Describe Resource Reservation Protocol (RSVP) 13.4 Describe how QoS prioritization of network traffic works 13.5 Demonstrate how QoS provide guarantees to deliver predictable results. 13.6 Describe latewst internet applications designed to use QoS
14. Demonstrate how network caching technologies are used in the enterprises to provide the optimized performance, more bandwidth, secure access and fast operations.	14.1 Define network caching 14.1 Analyse how web caching works 14.3 Outline HTTP caching standards 14.4 Describe the various areas of the computer and networking that uses caching 14.5 Describe Web Content Caching and Browser-Based Client Caching

Recommended Learning Resources:
Internetwork Infrastructure

Text Books	• Networking Complete by Dave Evans ISBN-10: 0782141439 • Networking Explained by Michael Gallo and William M. Hancock ISBN-10: 1555582524 • The Illustrated Network: How TCP/IP Works in a Modern Network by Walter Goralski. ISBN-10: 0123745411
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	None